

# THE MINING CONGRESS JOURNAL

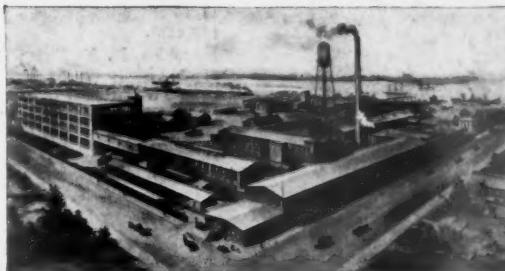
VOL. III

No. 3

SAFETY-EFFICIENCY-CONSERVATION

MARCH, 1917

## Mechanical Rubber Goods for Mining



Factories, Quaker City Rubber Co., Phila.

In mining operations, everywhere, you will find our brands of Rubber Belting for Conveyors, Elevators, Main Drives, Mill Drives, etc.

Our Belting Experts are ever ready to advise you about the kind of belting to use for any particular purpose. No charge for this service. A 180-page, illustrated catalog will be sent free on request. Please use your business letterhead.

**QUAKER CITY RUBBER CO.**  
PHILADELPHIA, 629 Market St.  
PITTSBURGH, 211 Wood St.

CHICAGO, 182 West Lake St.  
NEW YORK, 53 Murray St.

PUBLISHED BY  
**THE AMERICAN MINING CONGRESS**  
PUBLICATION OFFICE  
MUNSEY BUILDING                            WASHINGTON, D. C.  
\$ 2 00 PER YEAR                            20¢ PER COPY

# HERCULES EXPLOSIVES

## For Best Results

**A**T any time of year and under any conditions, Hercules Explosives give satisfaction. During winter, especially, their use is desirable if the best results are to be obtained. Hercules L. F. (Low Freezing) Explosives will not freeze until after water freezes. Because of this, their use during cold weather promotes safety and efficiency.

Hercules L. F. Explosives are as follows:

**Hercules L. F. Nitro-Glycerin Dynamite.** Made in all strengths from 15 per cent. to 60 per cent.

**Hercules L. F. Extra Dynamite.** Made in all strengths from 25 per cent. to 60 per cent.

**Hercules L. F. Extra Gelatin Dynamite.** Made in all strengths from 35 per cent. to 80 per cent.

**Hercules L. F. Permissibles.** These explosives are made expressly for use in dusty and gaseous mines.

For an informative booklet on the use of L. F. Explosives address

**HERCULES POWDER CO.**  
Wilmington, Delaware



# THE MINING CONGRESS JOURNAL

MARCH

## CONTENTS

1917

Armour plate plant.....	101	Utah chapter.....	107
California industrial commission.....	113	Withdrawals.....	91
Coal, detailed statement.....	97		
Fatality rate.....	112	<b>INDEX TO ADVERTISERS</b>	
Inspections.....	112	Allison Coupon Co.....	7f
January tonnage.....	99	Allis-Chalmers Manufacturing Co.....	9b
New production.....	93	Atlas Powder Co.....	8b
Variation in statistics.....	93	American Steel & Wire Co.....	4b
Railroad classification.....	91	American Mine Door Co.....	5b
Refuses to halt suit.....	88	Ameling Prospecting Co., The H. R.,	
Safety service.....	100		Inside back cover
Coke bulletin valuable.....	91	Associated Geological Engineers, The.....	11f
Colombian taxes high.....	98	Blum & Co., Julius.....	8f
Corvallis station.....	94	Bartlett, Snow & Co., C. O.....	7b
Darton, N. H. (cut).....	89	Channon Co., H.....	2b
Editorials.....	81	Chicago Perforating Co.....	11f
Colorado industrial disputes investigation act.....	81	Chicago Belting Co.....	3b
May be issue soon.....	81	Denver Quartz Mill & Crusher Co., The.....	7b
Step toward industrial peace.....	81	Du Pont de Nemours Powder Co., The E. I.....	8b
Cooperation the keynote.....	81	Equitable Powder Co.....	8b
Investigation of industrial disputes.....	81	Electrical Material Co.....	8f
Failure of leasing system.....	81	Goodman Mfg. Co.....	4b
Up to the administration.....	81	Heller & Brightly.....	6b
The way to resume.....	81	Herzler & Henninger Machine Works.....	5b
Another labor war threatened.....	81	Hercules Powder Co.....	Inside front cover
Fatality rate.....	95	Hunt & Co., Robert W.....	9f
Federal Reserve reports on mines.....	95	Holmes & Bros., Inc., Robert.....	9b
Flotation, interfering factors.....	100	Imperial Brass Co.....	8f
Oil from wood waste.....	91	Irvine Smelting & Refining Works.....	10f
Sagebrush oil.....	100	Jeffrey Mfg. Co.....	Outside back cover
Geologist and the reserve corps.....	98	Koering Cyaniding Process Co.....	9f
Government fuel.....	92	Ledoux & Co., Inc.....	9f
Graphite mining increasing.....	112	Lee Electric Radiator Co.....	6b
Hazards of mining.....	94	Lettsome & Co., A. R.....	7b
Hoover addresses engineers.....	110	Litchfield Foundry & Machine Co.....	5b
Labor, mine operators' views.....	102	Longyear, E. J. Co.....	9f
Leaver, Edmund I., appointed.....	100	Manhattan Rubber Co.....	Front cover
Legal decisions.....	111	Marionneaux, Stott & Beck.....	11f
Luminescence.....	94	Macomber & Whyte Rope Co.....	6b
Metal mine work to begin.....	88	Mines Otolok Co.....	8f
Military survey.....	98	Phelps, Dodge & Co.....	9f
Moore heads mining engineers.....	90	Phillips Mines & Mill Supply Co.....	2b
Moscow station.....	94	Professional Cards.....	11f
Paint manufacturers alarmed.....	89	Prox Co., The Frank.....	6b
Potash.....	94	Quaker City Rubber Co.....	9b
Publications, Bureau of Mines.....	96	Schieren Co., Charles A.....	10b
Revision of laws.....	97	Sullivan Machinery Co.....	114
Rochester district.....	96	Stephens-Adamson Mfg. Co.....	12f
Ryan, Francis C., appointed.....	90	Susquehanna Coal Co.....	10f
Topographers join reserve corps.....	137	Southern Illinois Machine & Foundry Co.....	5b
Tyrone district.....	97	Thorne, Neale & Co., Inc.....	10f
Umpleby, Joseph B. (cut).....	96	Turner, Laurin H. & Co.....	7b
		Winther Motor Truck Co.....	1b

## BUYERS' DIRECTORY

Names in black face type are Mining Congress Journal Advertisers.

### INDEX

#### ACID, SULPHURIC

American Zinc & Chemical Co., Langlois, Pa.  
American Zinc, Lead & Smelting Co., 55 Congress Street, Boston, Mass.  
Granby Mining & Smelting Co., Suite 1710, Third National Bank Building, St. Louis, Mo.  
Hegele Zinc Co., Danville, Ill.  
**Irvington Smelting & Refining Works, Irvington, N. J.**  
New Jersey Zinc Company, 55 Wall Street, New York, N. Y.

#### AGITATORS

Conklin, H. R., Joplin, Mo.  
Dorr Company, Denver, Colo.

#### AUTOMATIC (Mine Doors, Truck and Electric Switches)

**American Mine Door Co., Canton, Ohio**

#### AIR COMPRESSORS

**Sullivan Machinery Co., Chicago, Ill.**

#### AMALGAMATORS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

#### ANEMOMETERS

Letsome & Co., A. R., Lytton Building, Chicago, Ill.  
Taylor Instrument Co., Rochester, N. Y.

#### ARMATURES

Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

#### ASSAYERS

Baker & Co., Newark, N. J.  
**Ledoux & Co., Inc., 99 John Street, New York**

#### BALANCES

Troemner, Henry, 911 Arch Street, Philadelphia, Pa.  
Ainsworth & Sons, Wm., Denver, Colo.  
Denver Fire Clay Co., Denver, Colo.

#### BEARINGS (Ball and Roller)

S. K. F. Ball Bearing Co., Hartford, Conn.  
Hyatt Roller Bearing Co., Newark, N. J.  
Hess-Bright Mfg. Co., Front and Erie Streets, Philadelphia, Pa.

#### BELTING (Conveyor, Elevator, Transmission)

**Chas. A. Schieren Co., (Duxbury) 51 Ferry Street, New York City.**  
Goodrich Co., B. F., Akron, Ohio  
Dick, Ltd., R. & J., Passaic, N. J.  
Link Belt Company, Chicago, Ill.  
Webster Mfg. Co., Tiffin, Ohio  
Jeffrey Mfg. Co., 958 N. Fourth Avenue, Columbus, Ohio  
H. Channon Co., Chicago, Ill.  
Chicago Belting Co., Chicago, Ill.  
Manhattan Rubber Co., Passaic, N. J. (Rubber Belting "Con-dor.")  
**C. O. Bartlett & Snow & Co., Cleveland, Ohio.**

#### BELTING SUPPLIES

Chicago Belting Co., Chicago, Ill.  
**Chas. A. Schieren Co., 51 Ferry Street, New York City.**

#### BINS (Coke and Coal)

**Jeffrey Mfg. Co., Columbus, Ohio**

#### BITS AND BIT STEEL

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

#### BLOWERS

American Blower Co., Detroit, Mich.  
Hendrie & Bolthoff M. & S. Co., Denver, Colo.  
Connerville Blower Co., Connerville, Ind.

General Electric Co., Schenectady, N. Y.

#### BLOWERS (Centrifugal)

Ingersoll-Rand Co., 11 Broadway, New York City

#### BIT SHARPENERS

**Sullivan Machinery Co., Chicago, Ill.**

#### BLASTING SUPPLIES

Aetna Explosives Co., 2 Rector Street, New York City  
du Pont Powder Co., The E. I. du Pont Powder Co., East Alton, Ill.

Hercules Powder Co., Wilmington, Del.

Atlas Powder Co., Wilmington, Del.

#### BOILERS

American Locomotive Co., 30 Church Street, New York City

Abendroth & Root Mfg. Co., 45 Broadway, New York City

Hendrie & Bolthoff M. & S. Co., Denver, Colo.

Allis-Chalmers Mfg. Co., Milwaukee, Wis. (feed pump).

#### BUCKETS (Elevator)

**Jeffrey Mfg. Co., Columbus, Ohio**

Link Belt Co., Chicago, Ill.

Webster Mfg. Co., Tiffin, Ohio  
Robins Conveying Co., New York City

**C. O. Bartlett & Snow & Co., Cleveland, Ohio.**

#### BUCKETS (Clam Shell)

**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**

Link Belt Co., Chicago, Ill.

Brown Hoisting Machinery Co., Cleveland, Ohio

#### BRATTICE CLOTH

Turner, Laurin H. & Co., Merchants L. & T. Building, Chicago, Ill.

**Letsome & Co., A. R., 1521 Lytton Building, Chicago, Ill.**

**H. Channon Co., Chicago, Ill.**

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

#### BREAKERS (Construction and Machinery)

Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

**Jeffrey Mfg. Co., Columbus, Ohio**  
**Bartlett & Snow Mfg. Co., C. O., Cleveland, Ohio**  
Link Belt Co., Chicago, Ill.  
Vulcan Iron Works, Wilkes-Barre, Pa.  
Wilmot Engineering Co., Hazleton, Pa.

#### BRIQUETTING MACHINERY

**Jeffrey Mfg. Co., Columbus, Ohio**  
Link Belt Co., Chicago, Ill.

Malcolmson Briquet Engr. Co., Chicago, Ill.  
General Briquetting Co., 25 Broad Street, New York City

#### CABLES (Connectors and Guides)

**American Mine Door Co., Canton, Ohio**  
**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

#### CABLEWAYS

Broderick & Bascom Rope Co., St. Louis, Mo.

**Macomber & Whyte Rope Co., Kenosha, Wis.**  
Flory Mfg. Co., S., Bangor, Pa.  
Lessen & Son Rope Co., A., St. Louis, Mo.

**Jeffrey Mfg. Co., Columbus, Ohio**  
Electrical Material Co., Chicago, Ill.

#### CAGES

**Phillips Mine & Mill Supply Co., Pittsburgh, Pa.**  
Ottumwa Iron Works, Ottumwa, Iowa  
Eagle Iron Works, Des Moines, Iowa  
Link Belt Co., Chicago

Mining Safety Device Co., Bowerston, Ohio

**Herald & Henninger Machine Works, Belleville, Ill.**  
Holmes & Bros., Robt., Inc., Danville, Ill.

#### CASTINGS

**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
**Imperial Brass Co., 337 S. Dearborn St., Chicago, Ill.**

#### CAR DUMPS

**Phillips Mine & Mill Supply Co., Pittsburgh, Pa.**  
**Jeffrey Mfg. Co., Columbus, Ohio**  
Brown Hoisting Machinery Co., Cleveland, Ohio

Link Belt Co., Chicago, Ill.

#### CAR & CAR WHEELS

Duncan Foundry & Machine Works, Alton, Ill.  
Atlas Car & Mfg. Co., Cleveland, Ohio  
Fairmont Mining Machinery Co., Fairmont, W. Va.

Lehigh Car Wheel & Axle Co., Catawissa, Pa.

**Phillips Mine & Mill Supply Co., Pittsburgh, Pa.**  
Lobdell Car Wheel Co., Wilmington, Del.

Hockensmith Mine Car Co., Penn Station, Pa.  
Watt Mining Car Wheel Co., Barnesville, Ohio

**Southern Illinois Machine & Foundry Co., Murphysboro, Ill.**

#### CAR LOADERS

Link Belt Co., Chicago, Ill.  
Webster Mfg. Co., Tiffin, Ohio

#### CHAINS

Frank Prox Co., Terre Haute, Ind.

#### CHEMISTS

Ledoux & Co., A. R., Inc., 99 John Street, New York City  
Hunt, Robt., & Co., Insurance Exchange, Chicago, Ill.  
E. J. Longyear Co., Minneapolis, Minn.

#### CHLORINATION

Koering Cyaniding Process Co., Detroit, Mich.

#### COAL CRUSHERS

Jeffrey Mfg. Co., Columbus, Ohio  
Link Belt Co., Chicago, Ill.  
C. O. Bartlett & Snow & Co., Cleveland, Ohio.

#### COAL CUTTERS

Goodman Mfg. Co., Chicago, Ill.  
Jeffrey Mfg. Co., Columbus, Ohio  
Sullivan Machinery Co., Chicago, Ill.

#### COAL HANDLING MACHINERY

Jeffrey Mfg. Co., Columbus, Ohio  
Brown Hoisting Machinery Co., Cleveland, Ohio.  
Link Belt Co., Chicago, Ill.  
C. O. Bartlett & Snow & Co., Cleveland, Ohio.

#### COAL LOAD CHECKING DEVICE

Mines Otolok Co., Pittsburgh, Pa.

#### COAL MINING MACHINERY

Goodman Mfg. Co., Chicago, Ill.  
Jeffrey Mfg. Co., Columbus, Ohio

#### COAL WASHING MACHINERY

Jeffrey Mfg. Co., Columbus, Ohio  
Link Belt Co., Chicago, Ill.

#### COMPANY STORES (Coupons)

Allison Coupon Co., Indianapolis, Ind.

#### CONCENTRATORS (Table)

Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
Deister Concentrator Co., Port Wayne, Ind.  
Mine & Smelter Supply Co., Denver, Colo.  
Colorado Iron Works Co., Denver, Colo.

#### CONDENSERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

#### CONVEYORS, BELT

Jeffrey Mfg. Co., Columbus, Ohio  
Stephens-Adamson Mfg. Co., Aurora, Ill.

Link Belt Co., Chicago, Ill.

#### CONVEYORS & ELEVATORS

Jeffrey Mfg. Co., Columbus, Ohio  
Link Belt Co., Chicago, Ill.  
C. O. Bartlett & Snow & Co., Cleveland, Ohio.

#### COMPRESSORS, AIR

General Electric Co., Schenectady, N. Y.  
Chicago Pneumatic Tool Co., Chicago, Ill.  
Ingersoll-Rand Co., 11 Broadway, New York City  
Sullivan Machinery Co., Chicago, Ill.

#### CORE DRILLING

E. J. Longyear Co., Minneapolis, Minn.  
Ameling Prospecting Co., H. R., St. Louis, Mo. (core drill contractors)

#### COAL COMPANIES

Susquehanna Coal Co., Philadelphia, Pa.  
Thorne, Neale & Co., Philadelphia, Pa.

#### CONDENSERS

Cameron Steam Pump Works, A. S., New York City  
Ingersoll-Rand Co., 11 Broadway, New York City  
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.  
Worthington Pump & Machinery Corp., 115 Broadway, New York City.

#### CONTROLLERS

General Electric Co., Schenectady, N. Y.  
Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

#### CONVEYORS, BELT

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
Webster Mfg. Co., Tiffin, Ohio  
Power & Mining Machinery Co., 115 Broadway, New York City  
Robins Conveying Belt Co., New York  
Stephens-Adamson Mfg. Co., Aurora, Ill.

#### CONVEYORS, CHAIN FLIGHT

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
Webster Mfg. Co., Tiffin, Ohio  
Wilmot Engineering Co., Hasleton, Pa.

#### CONVEYORS, COAL

Fairmont Mining Machinery Co., Fairmont, W. Va.  
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.

#### CONVEYORS, SCREW

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
Webster Mfg. Co., Tiffin, Ohio

#### COPPER LEECHING

Koering Cyaniding Process Co., Detroit, Mich.

#### COUPONS

Allison Coupon Co., Indianapolis, Ind.

#### CRUSHERS, COAL

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Lehigh Car Wheel & Axle Works, Catasauqua, Pa.  
Link-Belt Co., Chicago, Ill.

Pennsylvania Crusher Co., Philadelphia, Pa.  
C. O. Bartlett & Snow & Co., Cleveland, Ohio.

#### CRUSHING PLANTS, COKE

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
Webster Mfg. Co., Tiffin, Ohio  
Williams Patent Crusher & Pulverizer Co., Old Colony Building, Chicago, Ill.

#### CRUSHERS

Allis-Chalmers Mfg. Co., Milwaukee, Wis.  
Braun Corporation, The, Los Angeles, Cal.

Braun-Knecht-Heimann Co., San Francisco, Cal.  
Buchanan Co., Inc., C. G., New York  
Colorado Iron Works Co., Denver, Colo.  
Denver Engineering Works Co., Denver, Colo.  
Denver Fire Clay Co., Denver, Colo.  
Hendrie & Bolhoff M. & S. Co., Denver, Colo.

Jeffrey Mfg. Co., The, 958 N. Fourth Street, Columbus, Ohio  
Power & Mining Machinery Co., 115 Broadway, New York City

Smith Engineering Works, 3195 Locust Street, Milwaukee, Wis.  
Sturtevant Mfg. Co., Boston, Mass.  
Traylor Engineering & Mfg. Co., Allentown, Pa.

Webb City & Carterville Foundry & Machine Works, Webb City, Mo.  
C. O. Bartlett & Snow & Co., Cleveland, Ohio.

#### CRANES

Brown Hoisting Machinery Co., Cleveland, Ohio

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.

#### CROSS-OVER DUMPS

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
Phillips Mine & Mill Supply Co., Pittsburgh, Pa.

#### CUTTER HEADS

Frank Prox Co., Terre Haute, Ind.

#### CYANIDING

Koering Cyaniding Process Co., Detroit, Mich.

#### DERRICKS AND DERRICK FITTINGS

The Hayward Co., 50 Church Street, New York, N. Y.

Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.

#### DESIGNERS OF PLANTS

Brown Hoisting Machinery Co., Cleveland, Ohio  
The Hayward Co., New York  
Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
McMyler Interstate Co., New York

#### DIAMOND CORE DRILL CONTRACTING

Hoffman Bros., Punxsutawney, Pa.  
Longyear Co., E. J., Minneapolis, Minn.

Punxsutawney Drilling & Contracting Co., Punxsutawney, Pa.  
Sullivan Machinery Co., Chicago, Ill.

Ameling, H. R., Prospecting Co., St. Louis, Mo.

#### DOORS, AUTOMATIC MINE

American Mine Door Co., Canton, Ohio

#### DREDGES

Flory Mfg. Co., S., Bangor, Pa.  
Marion Steam Shovel Co., Marion, Ohio

New York Eng. Co., 2 Rector Street, New York

- DRILLS, AIR**  
 Howells Mining Drill Co., Plymouth, Pa.  
 Ingersoll-Rand Co., 11 Broadway, New York City  
**Sullivan Machinery Co., Chicago, Ill.**  
 Whitcomb Co., Geo. D., Rochelle, Ill.  
**DRILLS, CORE**  
 Ingersoll-Rand Co., 11 Broadway, New York City  
**Longyear Co., E. J., Minneapolis, Minn.**  
**Sullivan Machinery Co., Chicago, Ill.**  
**DRILLS, ELECTRIC**  
 Chicago Pneumatic Tool Co., Chicago, Ill.  
 General Electric Co., Schenectady, N. Y.  
 Howells Mining Drill Co., Plymouth, Pa.  
 Ingersoll-Rand Co., 11 Broadway, New York City  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
**DRILLS, HAMMER**  
 Chicago Pneumatic Tool Co., Chicago, Ill.  
 Cleveland Rock Drill Co., Cleveland, Ohio  
 Denver Rock Drill Mfg. Co., Denver, Colo.  
 Hardsoc Wonder Drill Co., Ottumwa, Iowa  
 Ingersoll-Rand Co., 11 Broadway, New York  
 McKernan-Terry Drill Co., 230 Broadway, New York  
**Sullivan Machinery Co., Chicago, Ill.**  
 Whitcomb Co., Geo. D., Rochelle, Ill.  
**DRILLS, PISTON**  
 Chicago Pneumatic Tool Co., Chicago, Ill.  
 Cicchese Machine Co., Los Angeles, Cal.  
 Hardsoc Wonder Drill Co., Ottumwa, Iowa  
 Ingersoll-Rand Co., 11 Broadway, New York  
**Sullivan Machinery Co., Chicago, Ill.**  
**DRILLS, PROSPECTING**  
 Ingersoll-Rand Co., 11 Broadway, New York  
 New York Eng. Co., 2 Rector Street, New York  
**Sullivan Machinery Co., Chicago, Ill.**  
**DRILLS, ROCK**  
 General Electric Co., Schenectady, N. Y.  
 Howells Mining Drill Co., Plymouth, Pa.  
**Sullivan Machinery Co., Chicago, Ill.**  
**DUMPS, CROSS-OVER**  
 Fairmont Mining Machinery Co., Fairmont, W. Va.  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
 Link-Belt Co., Chicago, Philadelphia  
 Phillips Mine & Mill Supply Co., Pittsburgh, Pa.  
 Sanford-Day Iron Works, Knoxville, Tenn.  
**Sullivan Machinery Co., Chicago, Ill.**  
**DYNAMOS**  
**Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago**  
 Gregory Electric Co., Chicago, Ill.  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.  
**ELECTRICAL APPARATUS**  
 General Electric Co., Schenectady, N. Y.  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.
- ELECTRICAL SUPPLIES**  
 Electrical Service Supplies Co., Seventeenth and Cambria Streets, Philadelphia, Pa.  
 General Electric Co., Schenectady, N. Y.  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.  
 Electrical Material Co., Chicago, Ill.
- ELEVATORS**  
 Gifford-Wood Co., Hudson, N. Y.  
 Link-Belt Co., Chicago, Philadelphia  
 Webster Mfg. Co., Tiffin, Ohio
- ELEVATORS, BUCKET**  
**Stephens-Adamson Mfg. Co., Aurora, Ill.**  
 Webster Mfg. Co., Tiffin, Ohio  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**
- ENGINES (Hoist and Haulages)**  
**Litchfield Foundry & Machine Co., Litchfield, Ill.**
- ENGINES, GAS AND GASOLINE**  
**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**  
 Chicago Pneumatic Tool Co., Chicago, Ill.
- ENGINES**  
**Longyear, E. J., & Co., Minneapolis, Minn.**  
**Ameling Prospecting Co., H. R. St. Louis, Mo.**  
**Hunt, Robt., & Co., Insurance Exchange, Chicago, Ill.**  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
 Link-Belt Co., Chicago, Ill.
- ENGINES, OIL**  
**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**  
 Chicago Pneumatic Tool Co., Chicago, Ill.  
 Hendrie & Bolthoff M. & S. Co., Denver, Colo.  
 Ingersoll-Rand Co., 11 Broadway, New York  
 National Transit Pump & Mach. Co., Oil City, Pa.  
 Nordberg Mfg. Co., Milwaukee, Wis.
- ENGINES, STEAM**  
**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**
- ELECTRIC HOISTING MACHINERY**  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.  
**Litchfield Foundry & Machine Co., Litchfield, Ill.**
- ELECTRIC LOCOMOTIVES**  
**Goodman Mfg. Co., Forty-eighth Place and Halsted Street, Chicago**  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.
- ELECTRIC MINE SUPPLIES**  
 Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.
- ELECTRIC RADIATORS**  
**Lee Electric Radiator Co., 7031 Stewart Avenue, Chicago, Ill.**
- ELEVATOR MACHINERY**  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
 Link-Belt Co., Chicago, Ill.  
 Ottumwa Box Car Loader Co., Ottumwa, Iowa  
 Robins Conveying Belt Co., New York
- ENGINES (HOISTING AND HAULING)**  
 Eagle Iron Works, Des Moines, Iowa
- Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
**Litchfield Foundry & Machine Co., Litchfield, Ill.**  
 Ottumwa Box Car Loader Co., Ottumwa, Iowa
- EXTINGUISHERS, FIRE**  
 Justrite Mfg. Co., Chicago, Ill.
- EXCAVATING MACHINERY**  
 Brown Hoisting Machinery Co., Cleveland, Ohio  
 The Hayward Co., 50 Church Street, New York, N. Y.  
 Link-Belt Co., Chicago, Ill.
- EXPLOSIVES**  
**du Pont Powder Co., Wilmington, Del.**  
 Aetna Explosives Co., 2 Rector Street, New York City  
**Equitable Powder Co., East Alton, Ill.**  
**Hercules Powder Co., Wilmington, Del.**  
**Atlas Powder Co., Wilmington, Del.**
- FANS, VENTILATING**  
 American Blower Co., Detroit, Mich.  
 General Electric Co., Schenectady, N. Y.
- Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**  
 Ottumwa Iron Works, Ottumwa, Iowa  
 Stine, S. B., Osceola Mills, Pa.  
**Sullivan Machinery Co., Chicago, Ill.**  
 Vulcan Iron Works, Wilkes-Barre, Pa.  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.  
**Duncan Foundry & Machine Works, Alton, Ill.**
- FEEDERS, ORE**  
**Stephens-Adamson Mfg. Co., Aurora, Ill.**  
 Webster Mfg. Co., Tiffin, Ohio  
**Jeffrey Mfg. Co., 958 N. Fourth Street, Columbus, Ohio**
- FILTERS**  
 Colorado Iron Works Co., Denver, Colo.  
 Oliver Continuous Filter Co., San Francisco, Cal.  
**Koering Cyaniding Process Co., Detroit, Mich.**
- FLOTATION OILS**  
 Georgia Pine Turpentine Co., 160 Perry Street, New York City  
 Pensacola Tar & Turpentine Co., Gulf Point, Fla.
- FLOTATION, OIL**  
 Colorado Iron Works Co., Denver, Colo.  
 Oliver Continuous Filter Co., San Francisco, Cal.
- FURNACES, ASSAY**  
 Braun Corp., The, Los Angeles, Cal.  
 Braun-Knecht Heimann Co., San Francisco, Cal.  
 Denver Fire Clay Co., Denver, Colo.  
 Mine & Smelter Supply Co., Denver, Colo.
- FURNACES, MECHANICAL ROASTING**  
**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**  
 Dwight & Lloyd Sintering Co., Inc., New York City  
 General Chemical Co., 25 Broad Street, New York, N. Y.  
 Wedge Mechanical Furnace Co., 115 Chestnut Street, Philadelphia, Pa.
- FURNACES, BULLION MELTING**  
 Braun Corporation, The, Los Angeles, Cal.  
 Braun-Knecht-Heimann Co., San Francisco, Cal.  
 Denver Fire Clay Co., Denver, Colo.  
 Monarch Engineering & Mfg. Co., Baltimore, Md.

**FURNACES, SMELTING**  
Colorado Iron Works Co., Denver,  
Colo.  
Taylor Eng. & Mfg. Co., Allentown,  
Pa.

**GEARS**

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**  
Falk Co., The, Milwaukee, Wis.  
General The, Electric Co., Schenectady,  
N. Y.  
Webster Mfg. Co., Tiffin, Ohio  
Westinghouse Elec. & Mfg. Co., East  
Pittsburgh, Pa.  
**Jeffrey Mfg. Co., Columbus, Ohio**

**GENERATORS AND GENERATING SETS**

General Electric Co., Schenectady,  
N. Y.  
Morgan-Gardner Electric Co., 68 E.  
Adams Street, Chicago, Ill.  
Ridgway Dynamo & Engine Co.,  
Ridgway, Pa.  
Westinghouse Elec. & Mfg. Co., East  
Pittsburgh, Pa.  
**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

**GEOLOGISTS**

**Associated Geological Engineers,**  
Pittsburgh, Pa.

**GREASES**

Dixon Crucible Co., Joseph, Jersey  
City, N. J.  
Keystone Lubricating Co., Philadelphia,  
Pa.  
Ohio Grease Co., Loudenville, Ohio  
Sanford-Day Iron Works, Knoxville,  
Tenn.

**GUIDES**

**Frank Prov Co., Terre Haute, Ind.**

**HAMMERS, PNEUMATIC**

**Sullivan Machinery Co., Chicago, Ill.**

**HEADLIGHTS, ARC AND INCANDESCENT**

Electric Service Supplies Co., Seventeen  
and Cambray Streets, Philadelphia, Pa.

General Electric Co., Schenectady,  
N. Y.

Ohio Brass Co., Mansfield, Ohio

**HITCHINGS**

**Macomber & Whyte Rope Co.,**  
Kenosha, Wis.

**HOISTS, ELECTRIC**

Fory Mfg. Co., S., Bangor, Pa.  
General Electric Co., Schenectady,  
N. Y.

**Jeffrey Mfg. Co., 958 N. Fourth**  
Street, Columbus, Ohio

Ottumwa Iron Works, Ottumwa, Iowa  
Vulcan Iron Works, Wilkes-Barre, Pa.

**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

Denver Engineering Works Co., Den-  
ver, Colo.

Hendrie & Bolthoff M. & S. Co.,  
Denver, Colo.

Lidgerwood Mfg. Co., 96 Liberty Street,  
New York

Nordberg Mfg. Co., Milwaukee, Wis.

Wellman Seaver Morgan Co., The,  
Cleveland, Ohio

**HOISTS, PORTABLE**

Chicago Pneumatic Tool Co., Chicago,  
Ill.

Hendrie & Bolthoff M. & S. Co.,  
Denver, Colo.

Ingersoll-Rand Co., 11 Broadway, New  
York

**HOISTS, STEAM**

**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

Lidgerwood Mfg. Co., 96 Liberty Street,  
New York

Nordberg Mfg. Co., Milwaukee, Wis.

**Holmes, Robt., & Bros., Inc.,**  
Danville, Ill.  
Ottumwa Iron Works, Ottumwa, Iowa  
**Sullivan Machinery Co., Chicago, Ill.**

Vulcan Iron Works, Wilkes-Barre, Pa.  
**LEATHER** (Valves, packings, speci-  
alities)

Chicago Belting Co., Chicago Ill.

Chas. A. Schieren Co., New York City

Wellman Seaver Morgan Co., The,  
Cleveland, Ohio

**Litchfield Foundry & Machine Co.,**  
Litchfield, Ill.

**HOSE, AIR**

Cleveland Rock Drill Co., Cleveland,  
Ohio

Denver Rock Drill Mfg. Co., Denver,  
Colo.

Goodrich Co., The B. F., Akron, Ohio

Hardsco Wonder Drill Co., Ottumwa,  
Iowa

**HOSE (Rubber)**

**Quaker City Rubber Co., Philadel-  
phia, Pa.**

**HOISTING ROPES**

**Macomber & Whyte Rope Co.,**  
Kenosha, Wis.

**HAULING ROPES**

**Macomber & Whyte Rope Co.,**  
Kenosha, Wis.

**INSTRUMENTS, SURVEYING**

Ainsworth & Sons, Wm., Denver, Colo.  
Altendorf & Sons, T., Philadelphia,  
Pa.

**Heller & Brightly, Philadelphia, Pa.**  
(Engineering, Surveying, and As-  
tronomical)

**INSULATING MATERIAL, ELEC-  
TRIC**

Westinghouse Elec. & Mfg. Co., East  
Pittsburgh, Pa.

**Electrical Material Co., 618 W. Jackson**  
Boulevard, Chicago, Ill.

**INSULATORS, FEEDER WIRE**

Electric Service Supplies Co., Seven-  
teenth and Cambray Streets, Phila-  
delphia, Pa.

Ohio Brass Co., Mansfield, Ohio  
Westinghouse Elec. & Mfg. Co., East  
Pittsburgh, Pa.

**Electrical Material Co., 618 W. Jackson**  
Boulevard, Chicago, Ill.

**INSULATORS, SECTION**

Electric Service Supplies Co., Phila-  
delphia, Pa.

Ohio Brass Co., Mansfield, Ohio  
Westinghouse Elec. & Mfg. Co., East  
Pittsburgh, Pa.

**Electrical Material Co., 618 W. Jackson**  
Boulevard, Chicago, Ill.

**JIGS**

**Jeffrey Mfg. Co., 958 N. Fourth**  
Street, Columbus, Ohio

Link-Belt Co., Chicago, Philadelphia

Webster Mfg. Co., The, Tiffin, Ohio

**LAMPS, ACETYLENE**

Justrite Mfg. Co., Chicago, Ill.  
Milburn Co. Alex., Baltimore, Md.

Simmons Co., John, 34 Thirty-fifth

Street, Brooklyn, N. Y.

**LAMPS, ARC AND INCANDES-  
CENT**

General Electric Co., Schenectady,  
N. Y.

Westinghouse Elec. & Mfg. Co., East

Pittsburgh, Pa.

**Electrical Material Co., 618 W. Jackson**  
Boulevard, Chicago, Ill.

**LAMPS, ELECTRIC**

Edison Storage Battery Co., Orange,

N. J.

General Electric Co., Schenectady,

N. Y.

Westinghouse Elec. & Mfg. Co., East

Pittsburgh, Pa.

**LAMPS, SAFETY**

Ackroyd & Best, Ltd., Pittsburgh, Pa.

American Safety Lamp & Mine Supply

Co., Scranton, Pa.

Wolf Safety Lamp Co., New York City

Justrite Mfg. Co., Chicago, Ill.

**LAMPS, SAFETY CAP**

Edison Storage Battery Co., Orange,

N. J.

**LEATHER BELTING**

Chicago Belting Co., Chicago, Ill.

Chas. A. Schieren Co., New York City

City, (Duxbury).

**LOCOMOTIVES, ELECTRIC**

Atlas Car & Mfg. Co., Cleveland, Ohio

Baldwin Locomotive Works, Philadel-  
phia, Pa.

General Electric Co., Schenectady,  
N. Y.

**Goodman Mfg. Co., Chicago, Ill.**

**Jeffrey Mfg. Co., 958 N. Fourth**

Street, Columbus, Ohio

Morgan-Gardner Electric Co., 68 E.

Adams Street, Chicago, Ill.

Westinghouse Elec. & Mfg. Co., East

Pittsburgh, Pa.

**LOCOMOTIVES, GASOLINE**

Vulcan Iron Works, Wilkes-Barre, Pa.

Whitcomb Co., Geo. D., Rochelle, Ill.

**LOCOMOTIVES, RACK RAIL**

**Goodman Mfg. Co., Chicago, Ill.**

**LOCOMOTIVES, STEAM**

American Locomotive Co., 30 Church

Street, N. Y.

Baldwin Locomotive Works, Philadel-  
phia, Pa.

Vulcan Iron Works, Wilkes-Barre, Pa.

**LOCOMOTIVES, STORAGE BAT-  
TERY**

Atlas Car & Mfg. Co., Cleveland, Ohio

Edison Storage Battery Co., Orange,

N. J.

General Electric Co., Schenectady,  
N. Y.

**Goodman Mfg. Co., Chicago, Ill.**

Ironton Engine Co., Ironton, Ohio

**Jeffrey Mfg. Co., 958 N. Fourth**

Street, Columbus, Ohio

Westinghouse Elec. & Mfg. Co., East

Pittsburgh, Pa.

Whitcomb Co., Geo. D., Rochelle, Ill.

**LUBRICANTS**

Dixon Crucible Co., Joseph, Jersey

City, N. J.

Keystone Lubricating Co., Philadel-  
phia, Pa.

**LUBRICATORS**

Keystone Lubricating Co., Philadel-  
phia, Pa.

Ohio Grease Co., Loudenville, Ohio

Whitcomb Co., Geo. D., Rochelle, Ill.

**Imperial Brass Co., 537 S. Dear-**

born St., Chicago, Ill.

**MILLS, STAMP**

**Allis-Chalmers Mfg. Co., Milwau-  
kee, Wis.**

Denver Engineering Works Co., Den-  
ver, Colo.

Hendrie & Bolthoff M. & S. Co.,  
Denver, Colo.

Power & Mining Machy. Co., 115

Broadway, N. Y.

Traylor Eng. & Mfg. Co., Allentown, Pa.

**MINE DOORS, AUTOMATIC**

American Mine Door Co., Canton,

Ohio

**MINING MACHINES, CHAIN AND**

PUNCHER

**Goodman Mfg. Co., Chicago, Ill.**

Ingersoll-Rand Co., 11 Broadway,

New York City

**Jeffrey Mfg. Co., 958 N. Fourth**

Street, Columbus, Ohio

- Morgan-Gardner Electric Co., Chicago<sup>4</sup>  
III.  
**Sullivan Machinery Co., Chicago, III.**  
Whitcomb Co., Geo. D., Rochelle, Ill.,  
MINE HEATING  
**Lee Electric Radiator Co., 7031**  
Stewart Ave., Chicago, Ill.  
MINING MACHINES  
**Goodman Mfg. Co., Forty-eighth**  
Place and Halsted Street, Chicago  
Whitcomb, George D., Co., Rochelle,  
Ill.  
**Duncan Foundry & Machine**  
Works, Alton, Ill.  
MINING MACHINES (Electric)  
**Goodman Mfg. Co., Chicago**  
**Jeffrey Mfg. Co., 958 N. Fourth**  
Street, Columbus, Ohio  
Westinghouse Elec. & Mfg. Co.  
MINING MACHINERY  
**Denver Quartz Mill & Crusher Co.,**  
Denver, Colo.  
**H. Channon Co., Chicago, Ill.**  
**Litchfield Foundry & Machine Co.,**  
Litchfield, Ill. (Hoisting and  
Hauling Machinery.)  
**C. O. Bartlett & Snow Co., Cleve-**  
land, Ohio.  
MINE CAR HITCHINGS  
Hockensmith Wheel & Mine Car Co.,  
Penn Station, Pa.  
**Phillips Mine & Mill Supply Co.,**  
Pittsburgh, Pa.  
**Macomber & Whyte Rope Co.,**  
Kenosha, Wis.  
Electrical Material Co., 618 W.  
Jackson Boulevard, Chicago, Ill.  
MINE CAR TRUCKS  
**Duncan Foundry & Machine**  
Works, Alton, Ill.  
Hockensmith Wheel & Mine Car Co.,  
Penn Station, Pa.  
**Phillips Mine & Mill Supply Co.,**  
Pittsburgh, Pa.  
**Herzler & Henninger Machine**  
Works, Belleville, Ill.  
MINING MACHINE ROPE  
**Macomber & Whyte Rope Co.,**  
Kenosha, Wis.  
Electrical Material Co., 618 W.  
Jackson Boulevard, Chicago, Ill.  
MINE SIGNALS  
**American Mine Door Co., Canton,**  
Ohio  
MINING EQUIPMENT  
**Imperial Brass Co., 525 S. Racine**  
Ave., Chicago, Ill.  
Electrical Material Co., 618 W.  
Jackson Boulevard, Chicago, Ill.  
MOTORS  
General Electric Co., Schenectady,  
N. Y.  
**Goodman Mfg. Co., Chicago, Ill.**  
Ridgway Dynamo & Engine Co.,  
Ridgway, Pa.  
Westinghouse Elec. & Mfg. Co., East  
Pittsburgh, Pa.  
MOTOR TRUCKS  
**Wintner Motor Truck Co., Ken-**  
osha, Wis.  
OIL AND GREASE CUPS  
Keystone Lubricating Co., Philadel-  
phia, Pa.  
Lunkenheimer Co., Cincinnati, Ohio  
Ohio Grease Co., Loudenville, Ohio  
ORE, BUYERS AND SELLERS OF  
American Metal Co., New York City.  
American Smelting & Refining Co.,  
120 Broadway, New York  
American Zinc, Lead & Smelting Co.,  
55 Congress Street, Boston, Mass.  
American Zinc & Chemical Co.,  
Langlooth, Pa.  
Arizona Copper Co., Clifton, Ariz.  
Arkansas Zinc & Smelting Corp., 42  
Broadway, New York  
Balbach Smelting & Refining Co.,  
Newark, N. J.  
Bartlesville Zinc Co., 52 Broadway,  
New York  
Beer, Sontheimer & Co., 61 Broadway,  
New York  
Ducktown Sulphur, Copper & Iron Co.,  
Ltd., Isabella, Tenn.  
Edgar Zinc Co., Boatmen's Bank Bldg.,  
St. Louis, Mo.  
Granby Mining & Smelting Co., Suite  
1710, Third National Bank Building,  
St. Louis, Mo.; 165 Broadway, New  
York, N. Y.  
Grasselli Chemical Co., The, Cleveland,  
Ohio  
Hardy, Charles, 50 Church Street,  
New York  
Hegeler Zinc Co., The, Danville, Ill.  
Illinois Zinc Co., Peru, Ill.  
**Irvington Smelting and Refining**  
Works, Irvington, N. J.  
International Smelting Co., 42 Broad-  
way, New York  
Leavitt & Co., C. W., 30 Church Street,  
New York  
Matthiessen & Hegeler Zinc Co.,  
La Salle, Ill.  
Nichols Copper Co., 25 Broad Street,  
New York  
Pennsylvania Smelting Co., Pittsburgh,  
Pa.  
**Phelps, Dodge & Co., New York**  
City  
Philip Bros., 29 Broadway, New York  
Prinos Chemical Co., Prinos, Delaware  
Co., Pa.  
St. Joseph Lead Co., 61 Broadway,  
New York  
United Metals Selling Co., 42 Broad-  
way, New York  
United States Smelting, Refining &  
Mining Co., 55 Congress Street,  
Boston.  
ORE CRUSHERS  
**Denver Quartz Mill & Crusher Co.,**  
Denver, Colo.  
ORE FEEDERS  
**Denver Quartz Mill & Crusher Co.,**  
Denver, Colo.  
PICKING TABLES  
Fairmont Mining Machinery Co.,  
Fairmont, W. Va.  
**Jeffrey Mfg. Co., 958 N. Fourth**  
Street, Columbus, Ohio  
Link-Belt Co., Chicago.  
Morrow Mfg. Co., Wellston, Ohio  
PIPE, CAST IRON  
Hockensmith Mine Car Co., Penn  
Station, Pa.  
**Davies Supply Co., Chicago, Ill.**  
PIPE COVERING  
Highland Chemical Products Co.,  
Connellsville, Pa.  
Standard Paint Co., Woolworth Build-  
ing, New York  
PIPE, SPIRAL RIVETED  
Abendroth & Root Mfg. Co., 45  
Broadway, N. Y.  
PIPE, WROUGHT IRON  
Byers Co., A. M., 235 Water Street,  
Pittsburgh, Pa.  
**Davies Supply Co., Chicago, Ill.**  
POWER TRANSMISSION MA-  
CHINERY  
**Jeffrey Mfg. Co., 958 N. Fourth**  
Street, Columbus, Ohio  
Link-Belt Co., Chicago, Ill.  
Morse Chain Co., Ithaca, N. Y.  
Webster Mfg. Co., Tiffin, Ohio  
PULVERIZERS, COAL AND COKE  
**Jeffrey Mfg. Co., 958 N. Fourth**  
Street, Columbus, Ohio  
Lehigh Car Wheel & Axle Works,  
Catasauqua, Pa.  
PUMPS, CENTRIFUGAL  
Cameron Steam Pump Works, A. S.,  
New York City  
Keystone Driller Co., Beaver Falls, Pa.  
Platt Iron Works, Dayton, Ohio  
Stine, S. B., Osceola Mills, Pa.  
Worthington Pump & Machinery Corp.,  
115 Broadway, New York City  
PUMPS, MINE  
Alberger Pump & Condenser Co.,  
New York  
Cameron Pump Works, 11 Broadway,  
New York  
Hendrie & Bothoff M. & S. Co.,  
Denver, Colo.  
Wood & Co., R. D., Philadelphia, Pa.  
PUMPS, MILL  
Cameron Pump Works, 11 Broadway,  
New York  
Taylor Eng. & Mfg. Co., Allentown,  
Pa.  
PUMPS, PNEUMATIC AIR LIFT  
**Sullivan Machinery Co., Chicago,**  
III.  
PUMPS, POWER  
Cameron Steam Pump Works, A. S.,  
New York City  
Fairmont Mining Machinery Co.,  
Fairmont, W. Va.  
General Electric Co., Schenectady,  
N. Y.  
Platt Iron Works, Dayton, Ohio  
Worthington Pump & Machinery Corp.,  
115 Broadway, New York City  
PUMPS, STEAM  
Cameron Steam Pump Works, A. S.,  
New York City  
McGowan Co., John H., Cincinnati,  
Ohio  
PUMPS, VACUUM  
Cameron Steam Pump Works, A. S.,  
New York City  
Ingersoll-Rand Co., 11 Broadway,  
New York City  
Platt Iron Works, Dayton, Ohio  
Worthington Pump & Machinery Corp.,  
115 Broadway, New York City  
QUARRYING MACHINERY  
**Sullivan Machinery Co., Chicago,**  
III.  
RADIATORS  
**Lee Electric Radiator Co., 7031**  
Stewart Avenue, Chicago, Ill.  
RAIL BONDS  
Electric Service Supplies Co., Seven-  
teenth and Cambria Streets, Phila-  
delphia, Pa.  
General Electric Co., Schenectady,  
N. Y.  
Ohio Brass Co., Mansfield, Ohio.  
Westinghouse Elec. & Mfg. Co., East  
Pittsburgh, Pa.  
RESPIRATORS  
Goodrich Co., The B. F., Akron, Ohio  
ROCK CRUSHERS  
**Denver Quartz Mill & Crusher Co.,**  
Denver, Colo.  
ROPE, MANILA AND JUTE  
**American Steel & Wire Co., Chi-**  
cago, Ill.  
Broderick & Bascom Rope Co., St  
Louis, Mo.  
**Macomber & Whyte Rope Co.,**  
Kenosha, Wis.  
Waterbury Co., 80 South Street,  
New York City  
Wright Wire Co., Worcester, Mass.  
**Electrical Material Co., 618 W.**  
Jackson Boulevard, Chicago, Ill.  
ROPE, TRANSMISSION  
**American Steel & Wire Co., Chi-**  
cago, Ill.  
Broderick & Bascom Rope Co., St  
Louis, Mo.

Hazard Mfg. Co., Wilkes-Barre, Pa.  
 Leschen & Sons Rope Co., A., St. Louis,  
 Mo.  
 Waterbury Co., 80 South Street  
 New York City  
 Webster Mfg. Co., Tiffin, Ohio

**ROPE, WIRE**

**American Steel & Wire Co., Chicago, Ill.**  
 Broderick & Bascom Rope Co., St.  
 Louis, Mo.  
 Hazard Mfg. Co., Wilkes-Barre, Pa.  
 Leschen & Sons Rope Co., A., St. Louis,  
 Mo.

**Macomber & Whyte Rope Co., Kenosha, Wis.**  
 Waterbury Co., 80 South Street  
 New York City

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**RUBBER GOODS (Hose, Air Drills, etc.)**

**Quaker City Rubber Co., Philadelphia, Pa.**  
**H. Channing Co., Chicago, Ill.**  
**Manhattan Rubber Co., Passaic, N. J.**

**SCALES**

Street-Amet Weighing & Recording Co., 4101-4105 Ravenswood Avenue, Chicago, Ill.

**SCREENS AND PERFORATED SHEETING**

**Chicago Perforating Co., Chicago, Ill.**  
 Harrington & King Perforating Co., 628 North Union Avenue, Chicago, Ill.

**Jeffrey Mfg. Co., 938 N. Fourth Street, Columbus, Ohio**  
 Link-Belt Co., Chicago.  
 Roberts & Schaefer Co., Chicago, Ill.  
 Webster Mfg. Co., Tiffin, Ohio  
 Williams Patent Crusher & Pulverizer Co., Old Colony Building, Chicago, Ill.

**Holmes & Bros., Inc., Robt., Danville, Ill.**  
**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

**SCREENS, REVOLVING**

Harrington & King Perforating Co., The, 620 N. Union Avenue, Chicago, Ill.

**Hendrie & Bolhoff M. & S. Co., Denver, Colo.**  
**Stephens-Adamson Mfg. Co., Aurora, Ill.**  
 Taylor Eng. & Mfg. Co., Allentown, Pa.  
 Webster Mfg. Co., Tiffin, Ohio  
 Duncan Foundry & Machine Works, Alton, Ill.

**SHAFTING**

**Julius Blum & Co., 510 W. Twenty-fourth Street, New York City.**

**SHARPENERS, DRILL**

Denver Rock Drill Mfg. Co., Denver, Colo.  
 Hardsooc Wonder Drill Co., Ottumwa, Iowa  
 Ingersoll-Rand Co., 11 Broadway, New York

**Sullivan Machinery Co., Chicago, Ill.**

**SHOVELS, STEAM**

Ball Engine Co., Erie, Pa.  
 Keystone Driller Co., Beaver Falls, Pa.  
 Marion Steam Shovel Co., Marion, Ohio  
 The Automatic Shovel Co., Lorain, Ohio

**SIGNALS, MINE**

Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

**SIMELTERS**

American Smelting & Refining Co., 120 Broadway, New York

**American Zinc, Lead & Smelting Co., 55 Congress Street, Boston, Mass.**  
 Beer, Sontheimer & Co., Inc., 61 Broadway, New York  
 Illinois Zinc Co., Peru, Ill.  
 International Smelting Co., 42 Broadway, New York

**Irvinton Smelting & Refining Works, Irvinton, N. J.**

**SPLICE, CABLE**

**American Mine Door Co., Canton, Ohio**

**SPLICE, INSULATOR**

**American Mine Door Co., Canton, Ohio**

**SPLICE, TROLLEY WIRE**

**American Mine Door Co., Canton, Ohio**

**STORES (company coupons)**

**Allison Coupon Co., Indianapolis, Ind.**

**STORAGE BATTERIES**

Edison Storage Battery Co., Orange, N. J.  
 Marchal Storage Battery Locomotive Co., 1942 Railway Exchange Building, St. Louis, Mo.  
 Electric Storage Battery Co., Philadelphia, Pa.

**SWITCHBOARDS, POWER**

General Electric Co., Schenectady, N. Y.  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

**SWITCHBOARDS, TELEPHONE**

Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

**Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

**SWITCHES AND FROGS, TROLLEY**

**American Mine Door Co., Canton, Ohio**

**Electric Railway Equipment Co., Cincinnati, Ohio**

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**SWITCHES, FROGS AND CROSSINGS**

Cincinnati Frog & Switch Co., Cincinnati, Ohio

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**SWITCHES (Points, Latches and Throws).**

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**TELEPHONES, MINE**

Electric Service Supplies Co., Seventeenth and Cambria Streets, Philadelphia, Pa.  
 Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**TIPPLE EQUIPMENT**

Fairmont Mining Machinery Co., Fairmont, W. Va.

**Jeffrey Mfg. Co., 938 N. Fourth Street, Columbus, Ohio**  
 Link-Belt Co., Chicago  
 Roberts & Schaefer Co., Chicago, Ill.  
 Webster Mfg. Co., Tiffin, Ohio

**Phillips Mine & Mill Supply Co., Pittsburgh, Pa.**  
 Roberts & Schaefer Co., Chicago, Ill.  
 Sanford-Day Iron Works, Knoxville, Tenn.

**Webster Mfg. Co., Tiffin, Ohio**

**TRANSFORMERS**

General Electric Co., Schenectady, N. Y.

**TRAMWAYS, AERIAL**

Broderick & Bascom Rope Co., St. Louis, Mo.  
 Leschen & Sons Rope Co., A., St. Louis, Mo.  
 Waterbury Co., 80 South Street, New York City

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**TRACKS, PORTABLE RAIL, ETC.**

Carnegie Steel Co., Pittsburgh, Pa.  
 Cincinnati Frog & Switch Co., Cincinnati, Ohio  
 West Virginia Rail Co., Huntington, W. Va.

**TROLLEY, MATERIAL, OVERHEAD**

Electric Railway Equipment Co., Cincinnati, Ohio  
 Electric Service Supplies Co., Philadelphia, Pa.  
 General Electric Co., Schenectady, N. Y.  
**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**  
 Ohio Brass Co., Mansfield, Ohio  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

**TROLLEY WHEELS AND HARPS**

Electric Railway Equipment Co., Cincinnati, Ohio  
 Electric Service Supplies Co., Philadelphia, Pa.  
 Ohio Brass Co., Mansfield, Ohio  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

**SWITCHES AND FROGS, TROLLEY**

**American Mine Door Co., Canton, Ohio**

**Electric Railway Equipment Co., Cincinnati, Ohio**

**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**TRUCKS**

Winther Motor Truck Co., Kenosha, Wis.

**TUBING**

Julius Blum & Co., 510 W. Twenty-fourth Street, New York City.  
 Lettsome & Co., A. R., Lytton Building, Chicago, Ill.

**TURBINES, STEAM**

General Electric Co., Schenectady, N. Y.  
 Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

**VALVES**

Davies Supply Co., Chicago, Ill.

**WAGON LOADERS**

Jeffrey Mfg. Co., 938 N. Fourth Street, Columbus, Ohio  
 Link-Belt Co., Chicago, Philadelphia

**WASHERIES, COAL**

Link-Belt Co., Chicago  
 Roberts & Schaefer Co., Chicago, Ill.  
 Webster Mfg. Co., Tiffin, Ohio

**WEIGHT RECORDERS, AUTOMATIC**

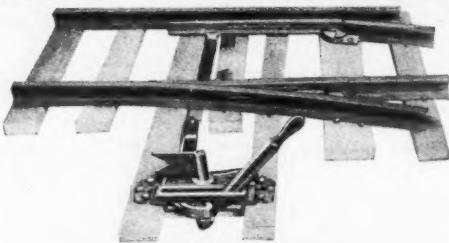
Streeter-Amet Weighing & Recording Co., 4101-4105 Ravenswood Avenue, Chicago, Ill.

**WIRE AND CABLE**

**American Steel & Wire Co., Chicago, Ill.**  
 Broderick & Bascom Rope Co., St. Louis, Mo.  
**Electrical Material Co., 618 W. Jackson Boulevard, Chicago, Ill.**

**WELDING SUPPLIES**

Imperial Brass Co., 537 S. Dearborn St., Chicago, Ill.



*Have you received our descriptive folder?*

ELECTRICAL MATERIAL COMPANY, Chicago

## END YOUR SWITCH TROUBLES FOREVER

Clinton Latches and Para-Lock Switch Throws solve one of the biggest problems the mine superintendent has to contend with. Once "down" they stay down and your cars stay on the track where they belong. Bring your tracks and switches up to date.

**SENT ON TRIAL** Specify length of latch and weight of rail.

Formerly  
THE W. R. GARTON COMPANY



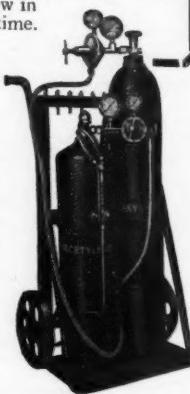
IMPERIAL WELDING AND CUTTING EQUIPMENT  
OXY ACETYLENE PROCESS

### Avoid Shut-downs!

That tense moment when an important machine breaks down—fraught with visions of a general shut-down—decreased tonnage—lost profits—can generally be overcome by having Imperial Equipment on the job. With it all broken machinery can be made practically as good as new in a surprisingly short time. Imperial Equipment welds everything in metal—cuts everything in steel or wrought iron. Every mine repair shop should have this compact, portable, safe, and exceedingly economical apparatus.

Let us show you how Imperial Equipment saves wonderfully in time, labor, and money—how it pays for itself in one or two operations. Write for facts and prices.

Imperial Brass  
Mfg. Co.  
525 S. Racine Avenue  
Chicago



### How OTOLOK Stops the "Scraps"

OTOLOK is a registered letter, a certified check and a gilt edge insurance policy all in one.

It sends the loaded car from the coal face to the tipple, through half a dozen hands with the original check securely locked in place so it can not possibly be tampered with.

All check squabbles are stopped, the moment OTOLOK is fixed in place. It is easy, cheap and absolutely fool-and-crook-proof.

Write us for full information.

**THE MINES OTOLOK CO.**  
House Building Pittsburgh, Pa.



## Seamless Steel Tubing

Cold Drawn Shafting and Screw Steel  
Hollow and Solid Mine Drill Steel



**JULIUS BLUM & COMPANY**  
(KEYSTONE STEEL & TUBE CO., Inc.)  
510-512 West 24th Street  
NEW YORK

BRANCHES:

New York:  
Detroit

Boston  
St. Louis

Philadelphia  
San Francisco

Buffalo  
Denver

Cleveland  
Calumet

Chicago  
Seattle

Pittsburgh  
Los Angeles

## E. J. LONGYEAR COMPANY

*Exploring Engineers*

Diamond Drill Contractors and  
Manufacturers

Examination

Exploration  
and Development  
of  
Mineral Lands

MINNEAPOLIS

MINNESOTA

Robert W. Hunt

Jas. C. Hallsted

Jno. J. Cone

D. W. McNaugher

## ROBERT W. HUNT & CO.

*Engineers*

Bureau of Inspection, Tests and Consultation

2200 Insurance Exchange,  
Chicago

Mining Engineers and Chemists

Inspection Construction Materials and  
Machinery at Point of Manufacture.

HIGHEST DEVELOPMENT IN CYANIDING  
ACME OF PERFECTION IN COPPER LEACHING

## THE KOERING METAL RECOVERY DRUM

constructed for Cyaniding, Hypolixivation, Copper Leaching, and Chlorination; combining Agitator, Filter and Washer; doing all functions between the grinding machinery and the precipitating device in one compact unit; accomplishing highest extraction in shortest period of time; saving labor, power, and chemicals.

*Most Economical Process for Treating Low Grade Ores  
Not an Experiment—Employed in Practical Use*

### HAVE YOU ANY FILTER TROUBLE?

*We can solve your problem, no matter how difficult*

Arrange for sending ore samples for assays and test treatments. We have the best equipped metallurgical, analytical and testing laboratory. Write for particulars.

## KOERING CYANIDING PROCESS COMPANY

BEN R. KOERING, E. M. President,  
Member American Electrochemical Society  
Member American Mining Congress.

511 Hammond Building  
DETROIT, MICH.

## PHELPS, DODGE & CO.

*Selling Agents of the*

Copper Queen Consolidated Mining Co.  
Calumet & Arizona Mining Co.  
Detroit Copper Mining Co., of Arizona  
Moctezuma Copper Co.

*Electrolytic Copper, Wire Bars, Plates, Ingots  
and Cathodes and P. D. Co. Casting Copper*

Cor. Cliff and John Streets  
NEW YORK

## LEDOUX & COMPANY, Inc.

NEW YORK

Sample and Assay Ores and  
Metals

Having representatives at buyers' works we receive, weigh, sample and assay consignments representing the sellers in all transactions. We are not dealers or refiners.

Laboratory and Office: 99 John Street

# Thorne, Neale & Company

*Incorporated*

601-610 Stephen Girard Building, Philadelphia, Penna.

*Temple Collieries—*  
Harry E., L. V.; Forty  
Fort, L. V.; Mount  
Lookout, L. V. or D.,  
L. & W.; Lackawanna,  
D., L. & W. or Erie.

*Schuylkill Collieries—*  
Buck Run, P. & R.;  
New Castle, P. R. R.

**ANTHRACITE**

AND

**BITUMINOUS**

**COALS**

Agents for

Pardee Bros. & Co.  
Lattimer-Lehigh

*Bituminous—Sonman  
Shaft, "B" Vein; Son-  
man Slope, "E" Vein.*

Sonman Smithing—1½-inch Screened, Low Sulphur, Spongy Coke

SHIPMENTS—RAIL OR WATER

CHAS. E. FERNBERG, *General Sales Agent*

New York Office: 17 Battery Place

Baltimore

Boston

Chicago

Buffalo

Mauch Chunk

Cable Address: "THORNEALE"

## SUSQUEHANNA COAL CO.

MINERS AND SHIPPERS

### SUPERIOR ANTHRACITE

*General Office*

907 COMMERCIAL TRUST  
BUILDING  
PHILADELPHIA, PA.

*Sales Offices*

NEW YORK . . . . . No. 120 Broadway  
PHILADELPHIA . . . 1436 Commercial Trust Bldg.  
CHICAGO . . . . . 1305 Old Colony Bldg.  
ERIE, PA. . . . . 210 Marine Bank Bldg.  
BALTIMORE . . . . . 100 Chamber of Commerce Bldg.  
WILLIAMSPORT, PA. . . . . 1, 2 & 3 Hart Building

## Irvington Smelting and Refining Works

*Buyers, Smelters and Refiners of  
Gold, Silver, Lead, Copper and Platinum  
Ores, Sweeps and Bullion*

*Manufacturers of Copper Sulphate*

IRVINGTON :: :: :: NEW JERSEY  
N. Y. OFFICE—Charles Engelhard  
Hudson Terminal Building  
30 Church Street

NEARLY every mem-  
ber of The American  
Mining Congress utilizes  
the services of Mining  
Engineers frequently.

**EDMUND B. KIRBY***Mining Engineer and Metallurgist*

918 Security Bldg., St. Louis

Specialty: The expert examination of mines and metallurgical enterprises.

**ELI T. CONNER***Mining Engineer "Coal"*

Specialty: Managerial Consultation on Coal Mining

28 Liberty Street

NEW YORK, N. Y.

**JOHN D. FIELDS***Mining Engineer*Designing and Constructing Copper Leaching  
Plants a Specialty

MAXVILLE

MONTANA

**SEELEY W. MUDD, Mining Engineer**1208 Hollingsworth Building Los Angeles, Cal.  
Code: Bedford McNeillCable Address  
"Macpayne" New York

Usual Codes

**HENRY MACE PAYNE***Consulting Mining Engineer*

Woolworth Building

NEW YORK

**RUHL & STEWART***Mining Engineers*

JOPLIN

MISSOURI

**HARRIS-STEVENS COMPANY**Engineers, Designers, Manufacturers, Modern Mine Cars  
First National Bank Bldg., PITTSBURGH, PA.

Thomas Marioneaux B. N. C. Stott Clarence M. Beck

**MARIONEAUX, STOTT & BECK***Attorneys and Counselors*

Mining Law and General Practice

405-6-7 Kearns Building

SALT LAKE CITY

**TOUT & McCARTHY, Butte, Mont.***Assayers and Chemists*

Assays, Analysis and Tests, Independent Control Work

Cable Address, "Consutoil" Code, Bedford McNeill

**THE  
ASSOCIATED GEOLOGICAL  
ENGINEERS**P. G. CLAPP and M. L. FULLER  
Managers*Examinations and Reports on  
Mineral Properties**Specialists in Oil and Gas Problems*120 Broadway..... NEW YORK CITY  
1333 F St..... WASHINGTON, D. C.  
331 Fourth Ave..... PITTSBURGH, PA.Herbert Goodall Archie J. Goodall  
**GOODALL BROS., Assayers and Metallurgists**  
Smelter Shipments Checked Controls a Specialty  
38 South Main Street, HELENA, MONTANA**H. N. LAWRIE***Consulting Mining Geologist*

526 Yeon Building

PORTLAND OREGON

L. D. Bell Phone,

1201 Grant

Cable "Rolyat,"

W. U. Code

**SAM'L A. TAYLOR, C. E.**

M. Am. Soc. C. E. M. Am. Inst. M. E.

*Consulting, Civil and Mining Engineer*

506-509 Second National Bank Bldg.

PITTSBURGH, PA.

**WM. GRIFFITH***Mining Engineer, Geologist*

COAL EXCHANGE, SCRANTON, PA.

Specialty—COAL Careful Reports, Estimates, etc.  
Interviews by appointment, New York or Philadelphia**H. P. DICKINSON***Mining Engineer—Metallurgist*

Room 650 Transportation Bldg.

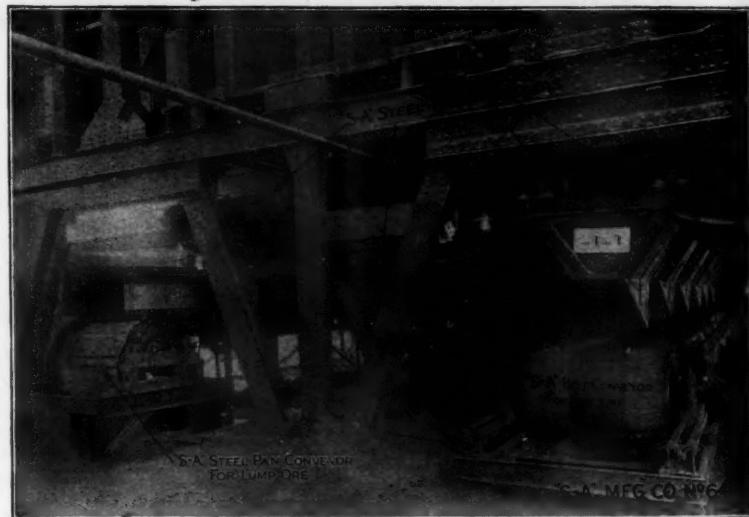
CHICAGO, ILL.

**SCREENS OF ALL KINDS**Chicago Perfotating Co.  
3443 West 24th Place  
Tel. Canal 1418 CHICAGO, ILL.

# Handling Low Grade Ore Profitably



The problem every mine owner has to solve in handling low grade ores is the crushing cost and handling cost. Reduce to the minimum and profits are in direct proportion to the reduction. Facts you will admit without argument.



What "S-A" Machinery is doing for other mining companies to make it profitable to handle low grade ore it will do for you. Put your ore conveying problems up to the "S-A" engineers. Advice, preliminary plans and cost estimate gladly furnished. All this information together with a copy of the interesting house organ "The Labor Saver" devoted exclusively to labor saving equipment and its application—free for the asking—no obligation incurred in responding. Write us today for full particulars.

## Stephens-Adamson Mfg. Co., CONVEYING, SCREENING, TRANSMISSION MACHINERY Aurora, Ill.

50 Church Street, New York, N. Y.  
First Nat. Bank Bldg., Chicago, Ill.  
H. W. Oliver Bldg., Pittsburgh, Pa.  
Federal Reserve Bank Bldg.,  
St. Louis, Mo.  
First National Bank Bldg.,  
Huntington, W. Va.  
503 Dooley Bldg., Salt Lake City, Utah  
J. W. Gates, District Manager

### BRANCHES

79 Milk Street, Boston, Mass.  
Colwell & McMullin, Dist. Mgrs.  
824 Dime Bank Bldg., Detroit, Mich.  
310 Stair Bldg., Toronto, Ontario,  
E. J. Banfield, Agent

Cable Address, Saco

So. African Agent, J. MacG. Love & Co., 1 and 3 London House, Love-day St., Johannesburg, So. Africa.  
Australian Agent, Arthur Leplastrier & Co., Circular Quay East, Sydney, Australia.  
Scandinavian Agent, C. S. Christensen, A/S, Post Box 85, Kristiania, Norway.

# THE MINING CONGRESS JOURNAL

*Official Organ of the American Mining Congress*

## AMENDMENTS PROPOSED TO COLORADO INDUSTRIAL DIS- PUTES INVESTIGATION ACT

The valid criticisms which have been made against the present Industrial Disputes Act in Colorado were directed to the fact that the present law places no limit upon the time during which the commission is required to make a report of its investigation of a threatened strike or lockout, thus leaving it in the power of the commission, by delaying its report, to continue in effect the prohibition against a change in working conditions.

Amendments have been favorably reported by the joint Industrial Relations Committee of the Colorado Legislature under which the commission is required to make a report within thirty days from the service of the original notice, except where the conditions are such that a determination cannot in justice be made within that period, under which condition the report is required to be made within ninety days from the date of the original notice, except where the parties to the dispute consent to a longer period.

The amendment proposed substitutes the following sections for Sections 29 and 30 of the present law:

[NOTE.—The present sections of this law will be found upon another page of this issue.]

Section 29. Employers and employees shall give at least thirty days notice to the party affected, and to the Commission, of any intended change affecting any and all conditions of employment.

Within ten days from the service of any such notice, the party or parties upon whom the notice is served shall file with the Commission their answer thereto, whereupon the Commission shall proceed to set a time for an investigation, hearing or arbitration upon the matters involved,

at some convenient place, which time shall be not less than five days nor more than ten days from the date of filing such answer, and shall cause due notice to be given to the parties filing such notice, of the time and place of hearing.

Such investigation, hearing or arbitration shall be conducted speedily, and the determination or findings in such cases shall be made and published within ten days from the conclusion of such investigation, hearing or arbitration, and within thirty days from the service of the original notice therein, except that in cases where the investigation, hearing or arbitration cannot, with justice, be concluded and the award made within the said period of thirty days, the time therefor may be extended by consent of the parties, or by formal order of the Commission, entered upon its records and setting forth the reasons therefor; provided, however, that no such extension shall operate to delay the final award or determination for more than ninety days from the service of the original notice in said matter, except where the parties themselves consent to a longer period of time.

Section 30. It shall be unlawful for any employer to declare or cause a lockout, or for any employee to go on a strike, on account of any dispute, prior to or, during an investigation, hearing, or arbitration of such dispute by the Commission, or board, under the provisions of this act, or without notice as provided in this act.

In every case where a dispute has been made the subject of an investigation, hearing or arbitration by the Commission, neither of the parties, nor the employees affected, shall alter the conditions of employment, or, on account of the dispute, do or be concerned in doing, directly or indirectly, anything in the nature of a lockout or strike, or a suspension or discontinuance of work or employment; but the relationship of employer and employee shall continue unchanged and uninterrupted by the dispute, until the final determination thereof by the Commission; but neither employer nor employee shall use this or any other provision of this act for the purpose of unjustly maintaining a given condition of affairs through delay, or engage in any unfair practice, during the hearing and determination of such dispute by the Commission; provided, that nothing in this act shall prohibit the suspension or discontinuance of any industry or of the working of any persons therein for any

cause not constituting a lockout or strike, or prevent any employe from quitting his employment and terminating the relation of employer and employee, or any employer from discharging an employe for causes other than those arising on account of such dispute; provided, further, that nothing in this act shall be held to restrain any employer from declaring a lockout, or any employe from going on a strike in respect to any dispute after the same has been duly investigated, heard, or arbitrated, and finally determined under the provisions of this act.

The objection of the labor leaders to the law is based upon the pretense that this law is an interference with the right of individual liberty. The proposed amendment meets this criticism by giving absolute liberty to suspend or discontinue "any industry or of the working of any persons therein for any causes *not constituting a lockout or strike.*"

It is hoped that the amendments proposed will be enacted. These amendments seem to meet every criticism which any person can reasonably suggest to the provisions of the law. Only those who are of the opinion that might makes right can object to the investigation of a controversy before such steps are taken as mean loss to all parties involved and loss to the people as a whole. It is time that the activities of large bodies of men which seriously affect the interests of the public shall be brought under public control. While the right of an individual to loiter upon the street may be a personal right, the right of a thousand men to impede traffic and destroy the purpose to which the street is dedicated is a violation of the rights of the public as a whole. In the words of Governor Carlson's retiring message to the legislature of Colorado:

"It is inconceivable how investigations where the status of both parties is preserved can be harmful to either. It would be a terrible thing to annul the work along these lines already started and to prevent the extension of such activities in the future. I urge, therefore, that there be no abridgment of the commission's powers, and that its appropriation be increased in amount as much as the revenues and other demands will permit."

#### MAY BE ISSUE SOON

In view of the developments in the negotiations in progress between the

Federal Trade Commission and the paper manufacturers it would appear that the possibility of Government regulation of coal-mining operations may be an issue sooner than most persons expect. When George Otis Smith, the director of the Geological Survey, suggested this possibility at the convention of the American Mining Congress at Chicago last November, there were many who took the position that such a condition was absolutely hypothetical and was so unlikely to arise in actuality as to make it unnecessary to consider it at this time.

Those who have not read Dr. Smith's paper, of which C. E. Lesher is the co-author, should secure a copy of the Proceedings of the American Mining Congress and go over this paper carefully. Dr. Smith is in a position to know more than the average mine operator as to the trend of public thought in such matters. It would be well to have in mind his conclusions in this regard.

#### A GREAT STEP TOWARD INDUSTRIAL PEACE

A very cheering report comes from Colorado to the effect that the Denver Trades and Labor Assembly at a recent meeting adopted a program of "conciliation rather than force" in the settlement of any grievances that may arise in the future. The report states that this action is regarded by the union advocates as the greatest step taken in the interest of the general welfare of Colorado in a decade.

It would seem that the Colorado Industrial Commission Law making illegal a strike or lock-out pending an investigation by the Commission will have a very beneficial effect.

After years of industrial dissension Colorado has had but three minor strikes in two years time, and these settled in a few days' time under the direction and by the recommendation of the Industrial Commission. Instead of the bitterness which was almost general two years ago the Trades Assembly now urges conciliation instead of force.\* We believe the Industrial Commission had much to do

with producing these conditions and this incident gives endorsement to the following statement of Commissioner Williams:

"I believe profoundly that this law will work to the advantage of labor and capital, and that it will bring a larger measure of industrial peace than our State or any other state has hitherto enjoyed.

"It may not solve the whole problem of industrial disputes or eliminate all strikes, but it will tend to solve the problem, it will lessen the number of strikes and it is at the very least a step in the right direction."

By all means let us have industrial peace. Where disputes do arise let them be adjusted in a civilized manner, by conciliation if possible, by mediation, and if necessary by arbitration.

#### COOPERATION THE KEY NOTE

Criticism has been made of the editorial attitude of THE MINING CONGRESS JOURNAL upon the ground that the American Mining Congress has presumed to be independent in its principles and to have earnestly sought the welfare of the wage earner as well as the operator and that the recent editorials in THE MINING CONGRESS JOURNAL seem to speak only for the operator and to criticize unduly the attitude of those labor leaders who have stood against the enactment of laws looking toward the arbitration of industrial disputes.

Notwithstanding the danger of this situation, THE MINING CONGRESS JOURNAL hopes to occupy this position and in the end, to receive the approval of both sides of industrial controversies. It is inevitable that there shall be industrial disputes. So long as human agencies control, advantages will be sought by each side not fair to the other side nor beneficial to the public at large.

The most notable success known to the writer in occupying this position of absolute fairness between the contending sides of an inevitable controversy was the late Dr. Joseph A. Holmes. His success in maintaining the friendship of both operator and miner, as he lead the way toward better things for both, required a combination of diplomacy, sagacity and tender sympathy, which is seldom found in any one individual.

THE MINING CONGRESS JOURNAL emulates his example and will, so far as it has power, undertake to demonstrate that the best interests of each will, in the end, be served by that which is best for all and that the highest success of the operator and the best welfare of the miner can be best served through a complete cooperation through which proper compensation shall be paid for service, proper and fair profit shall remain to the operator and the public shall receive its product at a price which it can afford to pay. In undertaking to maintain this position the journal will make mistakes but this inherent purpose will be found in whatever it may endeavor to present to its readers.

#### COMPULSORY INVESTIGATION OF INDUSTRIAL DISPUTES

The difference between civilization and barbarism is based upon the difference in methods by which disputes between the various members of society are settled. In conditions of barbarism, each man undertakes to be a law unto himself and to redress his own wrongs, a condition which means that might makes right. In other words, brute force is the final arbiter. The higher condition of civilization is that in which all disputes are necessarily left to some judicial body for determination. The citizen who undertakes to settle his grievance by open assault is counted a disturber of the public peace and is punished as such without reference to the merit of the controversy involved. The world today yearns for some condition in which disputes between nations may be settled by some just form of arbitration. Private disputes within civilized governments can receive their redress nowhere else but in the courts. Why then should it not be possible to settle industrial disputes by some other method than by strikes and lockouts, which are disastrous, not only to those involved in the controversy but to the public at large.

THE MINING CONGRESS JOURNAL believes without question that might does not make right, that those controversies which are settled as the result of force

only have never yet been permanently settled and that there is no reason why industrial disputes cannot be better settled by arbitration than by industrial war. Such arbitration must comprise a complete knowledge of the facts involved, a complete knowledge of industrial conditions. It must at all times have due regard and first regard for that right which is inherent to all American citizens, the right of individual liberty, a liberty not measured by membership or non-membership in any organization, a liberty not measured by bank balances, by the ownership of property, or by the lack of property interests.

THE MINING CONGRESS JOURNAL believes in the right of the laboring man to strike, but it does not believe that a prohibition of a general strike pending an investigation of the issues involved—is a violation of the right of liberty of any individual. The Sherman law was designed to prevent combined action through which the public may be injured. The individual wage earner has a right at all times to refuse to work, but when he undertakes by concerted action to force his employer, the right of the public should be given consideration. To restrain concerted action, is not a violation of any individual right. To restrain such action for the benefit of the public would surely seem to be within the province of any orderly government.

A comparison of conditions in the State of Colorado for ten or twenty years prior to the adoption of the Colorado Industrial Commission Law with the two years in which this law has been effective will convince any fair-minded man, wage earner or employer, that both sides have been mutually benefited by the operation of that law and any organization which openly advocates its repeal or stands in the way of enactment of similar laws elsewhere must rest under suspicion of being controlled by selfish interests.

#### THE FAILURE OF THE LEASING SYSTEM

To urge that the enactment of the leasing bills will open up the West to development is not convincing in the face

of the experience under the Alaskan Coal leasing bill.

This bill was signed by the President in August, 1914. Up to this time not a single operating lease has been granted under its provisions.

Alaska has needed coal all the time since 1886, as badly as our eastern cities have needed it, when a coal famine is threatened. For more than thirty years the United States Government has been trying to open up Alaskan coal. The coal resources of Alaska are unlimited. The need for its use has been pressing all of these years. The desire of the Government, most of that time, has been earnest, but the results are ludicrous and pitiful. It is said that fools learn only by experience. The Government don't appear to learn even by experience. The system which has kept Alaska from development is offered to the western States as a means of development. It has not worked in Alaska and it will do no better elsewhere.

---

#### UP TO THE ADMINISTRATION

The gold mining industry of the West is almost paralyzed because of the enormously high cost of cyanide.

The production of cyanide requires cheap power. The shortage is caused, first, by the extraordinary demand created by war conditions and second, by the embargo put upon the transmission of hydro-electric power across the border at Niagara by the Canadian Government.

Congress has rushed through a bill providing for a larger use of the water of the Niagara on the American side in order to partly make up the deficiency. Another arm of the same government is prosecuting citizens who have spent millions of dollars in the development of western water powers with the purpose of taking from them the rights-of-way upon which rests the security of the investments, and by this course has put an end to all similar enterprises. We are making vast appropriations for preparedness. Private enterprise, if it had not been interfered with, would have developed water-power plants in the West, which in the event of war would be the

most effective in meeting the demand. Why not now recognize the contract between the Federal Government and the several States and permit industrial preparedness by private capital, always available to the nation in time of war? The use of the waters of the arid West both by contract with the Federal Government (the Enabling Acts and the State Constitutions) and by prime necessity which is the highest law, belong to the individual States. Recognize that contract and there will be an industrial preparedness without which the tax payers of the nation will be called on to meet unnecessary and burdensome obligations.

Mr. Secretary Lane, the way to meet the situation is to cancel the water-power site withdrawal orders and to recommend to the Department of Justice the withdrawal of the litigation in which the Government is fighting to retain control of the water powers of the West.

The way to resume, Mr. Secretary, is to resume. It's not up to Congress. It's up to the Administration.

---

#### THE WAY TO RESUME IS TO RESUME

Secretary of the Interior Lane's letter to Senator Myers under date of February 10, urging action on the land leasing bills in order that western resources may be opened up to development, as a means of preparedness, calls attention to the fact that 6,000,000 acres of oil lands are locked up, that 3,000,000 acres of phosphate lands are locked up and that the largest deposit of potash in the country is locked up.

The Army and the Navy and the automobile users of the country need the oil. The Army and the Navy may need, and the consuming public does need the farm produce which the phosphate deposits might produce and the Army and the Navy may need the potash fundamental in the manufacture of explosives. In the face of the possibly increased demands of the future we shall have ample need for the results of unrestricted industrial activity. To meet these needs we shall not look to the oil wells operated

by the Government, but we shall look to those plants which have been developed by private enterprise.

While all will agree as to the importance of western development, but few who understand will approve the plan proposed. General Grant once said with reference to the resumption of specie payment "The way to resume is to resume." The way to open up western resources to development is to open them up.

If Secretary Lane wants the phosphate deposits of Montana to be opened up, let him recommend to the President that the withdrawal order as it relates to these deposits be cancelled. Without cheap sulphuric acid these deposits will be forever worthless.

Today thousands of tons of sulphuric acid are pouring out of the smelter stacks of Montana. The time is not too far distant when the sulphide ores of that section will be exhausted and when that time comes its phosphate deposits will in all probability be absolutely worthless. The people of the cities need cheaper food supplies. The farms of the country are starving for the phosphate which would add very materially to their production.

The restriction of western development pinches the wage earner's family in the industrial centers of the East, it pinches the West and it may become much more serious than has yet been imagined. The way to open up the West, Mr. Secretary, is to open up the West. The way to resume is to resume.

---

#### ANOTHER LABOR WAR THREATENED IN COLORADO

Just before going to press we learn that an effort to repeal the provision of the Colorado Industrial Commission Law is being supported by threats of civil war in case the demands of the agitators are not met by the Colorado Legislature.

Mr. Grant Hamilton, of Washington, D. C., after denouncing the law in Colorado is reported to have said, "No court, State or Federal, has the right to say whether a law is constitutional or not. The Supreme Court of the United

States has usurped that right, but there is no warrant for that usurpation. Therefore, there can be no force in the argument that labor must first seek to have the courts determine the constitutionality of this law. I represent the crystallized sentiment of the American workers on this law and I say that they will resist it to the uttermost. We will not submit to the fetters of slavery. We are inspired by the same spirit of revolt that moved our revolutionary forefathers. If this law is not repealed we will have recourse to that same power. We have the courage to revolt and will not be found wanting."

Mr. Ed Doyle, of the U. M. W. of A., expressed himself, as reported by the press, as follows:

"That there have been no important strikes in the last two years was not due to this law, but to the fact that unemployment was less, that all factories were working overtime and the competition between men for work was less. The coal miners remained quiet largely because they had not recovered from their last strike, but they are recovering now, and soon again will demand the right to belong to labor organizations and that that right be recognized by the mine owners. They are recovering, another strike is certain, and you all know what that means. Labor will not submit to this law any longer. I reiterate the warning Mr. Hamilton gave a while ago. The spirit of revolt will not be quelled while this law remains on the statute books of this State."

The effective carrying out of the threats of Mr. Hamilton and Mr. Doyle means the destruction of democracy. A republican form of government is based upon the control of the majority as represented by legislatures to make, courts to construe and administrative officers to execute, the law. The principle involved in the surrender of a legislature to the threat of a minority is indeed dangerous to the liberties of the people.

Mr. Doyle evidently believed that another strike in Colorado means the absolute setting aside of all the constitutional rights which are guaranteed by the constitution, the destruction of prop-

erty, bloodshed and murder. He does not hesitate. The recognition of organized labor by the operators is of greater importance than industrial peace.

The failure to repeal a law at the demand of a minority (which for a temporary period of investigation during which the demands of the parties to an industrial dispute may be considered and a remedy ordered) is to be made the excuse for another industrial war.

The real issue, as in the previous war, is not the right to belong to a labor organization which nobody disputes, but the recognition of the labor union by the employers. To accomplish this the Industrial Commission law is to be openly violated, the authority of the courts to be denied, the principle of democracy crucified.

The Constitution is the bulwark of the minority against injustice. The courts must uphold the Constitution and construe the law. Those who openly violate these principles may be numerous enough to be classed as rebels but never, until anarchy shall have put democracy under its feet, shall they be classed as patriots.

#### COLORADO INDUSTRIAL DISPUTES INVESTIGATION LAW

To meet the many requests to this office for the text of the Industrial Disputes Investigation provisions of the Colorado Industrial Commission Law we have had same printed and copies will be furnished upon request. For those who only desire general information we reproduce the principal features of the law as follows:

§29. Employers and employes shall give at least thirty days' notice of an intended change affecting conditions of employment with respect to wages or hours; and, in every case where a dispute has been made the subject of an investigation, hearing, or arbitration by the Commission, or the board, until the dispute has been finally dealt with by such Commission, or board, neither of the parties nor the employes affected, shall alter the conditions of employment with respect to wages or hours, or on account of the dispute, do, or be concerned in doing, directly or indirectly, anything in the nature of a lock-out or strike, or a suspension or discontinuance of work or employment; but the relationship of employer and employe shall continue uninterrupted by the dispute, or anything arising out of the dispute; but, if either party uses this or any other

provision of this Act for the purpose of unjustly maintaining a given condition of affairs through delay, such party shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not more than one hundred dollars.

§30. It shall be unlawful for any employer to declare or cause a lock-out, or for any employee to go on strike, on account of any dispute prior to or during an investigation, hearing, or arbitration of such dispute by the Commission, or the board, under the provisions of this Act; provided, that nothing in this act shall prohibit the suspension or discontinuance of any industry or of the working of any persons therein for any cause not constituting a lockout or strike, or to prohibit the suspension or discontinuance of any industry or of the working of any persons therein which industry is not affected with a public interest; provided, further, that nothing in this Act shall be held to restrain any employer from declaring a lockout, or any employee from going on strike in respect to any dispute after the same has been duly investigated, heard, or arbitrated, under the provisions of this Act.

§31. Nothing in this Act shall be construed to make any findings, determination of the rights of said parties, decision or award of said Commission or of any board of arbitration appointed thereby upon the facts of such controversy, binding, conclusive or enforceable upon any of the parties thereto, or affected thereby, unless

(1) Such parties have agreed in writing prior to the commencement of any such investigation or arbitration, or during the continuance thereof, to accept and be bound by the terms of such findings, determination of rights, decision or award, and then only to the extent in such written agreement provided; or

(2) Unless said parties shall agree to accept and be bound by such action of the Commission or board of arbitration after the same has been made known to them; provided, however, that in either such instance, the findings, determination of rights, decision and award of said Commission or board of arbitration, when confirmed by formal order of said Commission, shall be and remain in full force and effect, according to the terms and for the time provided in such formal order of the Commission, and shall be binding, effective and enforceable upon the parties thereto, as any finding, order or award of the Commission under the provisions of this Act.

§32. Any employer declaring or causing a lockout contrary to the provisions of this Act shall be guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not less than one hundred dollars (\$100.00) nor more than one thousand dollars (\$1,000.00) for each day or part of a day that such lockout exists.

Any employee, who goes on strike contrary to the provisions of this Act shall be guilty of a misdemeanor and, upon conviction thereof,

shall be punished by a fine of not less than ten dollars (\$10.00) nor more than fifty dollars (\$50.00) for each day or part of a day that such employee is on strike.

§33. Any person who incites, encourages, or aids in any manner any employer to declare or continue a lockout, or any employee to go or continue on strike, contrary to the provisions of this Act, shall be guilty of a misdemeanor, and, upon conviction thereof, shall be punished by a fine of not less than fifty dollars (\$50.00), nor more than one thousand dollars (\$1,000.00), or by imprisonment in the county jail for a term of not more than six months, or both such fine and imprisonment, in the discretion of the court.

A complete discussion of the workings of this law by Wayne C. Williams, a member of the Colorado Industrial Commission will be found in the proceedings of the 19th Annual Session of the American Mining Congress.

#### DERING AMPLY FITTED FOR HIS NEW JOB

Effective February 19, Jackson K. Dering became president of the O'Gara Coal Company, a company which is known nationally. Owing to various complications in its internal business affairs the highest type of ability is required to administer it. In seeking out Mr. Dering for this unusual responsibility the O'Gara Company could have made no wiser choice. Mr. Dering combines an exceptional sense of business acumen with a geniality of manner which is so necessary to the proper administration of any extensive business.

As one of the most active members of the American Mining Congress, Mr. Dering has been of great service in the work which we have been carrying forward. He was an important factor in making the recent Mining Congress Convention in Chicago the success it proved to be. His work for the American Mining Congress is ample evidence that his activities are not limited by his desire to push his personal interests. He has been willing to put his shoulder to the wheel and work for the common good of the mining industry.

#### USERS OF COAL WOULD DO MORE INTELLIGENT BUYING

The increasing prices of coal are having the effect of causing more systematic purchases of fuel. Numerous representatives of large users of coal have been making inquiries recently at the Geological Survey and at the Bureau of Mines and gathering information with the idea of purchasing their fuel more intelligently. In addition to careful analyses of coals and to studies of coal fields, maps are being drawn in the interest of individual users. These maps show all of the mines which are possible sources of fuel for individual plants and contain valuable information as to the kind of coal available, transportation facilities and other data.

## MORE ACTIVE WORK IN METAL MINING DISTRICTS TO BE BEGUN BY BUREAU OF MINES

### New Mine Rescue Cars Will be Used in Tour of Western States in Effort to Advance Mine Rescue and First-Aid Work—Advice Will be Offered Mine Operators

Very active work on the part of the Bureau of Mines in the metal mining field will begin early in April, when it is expected to have ready for use the three new mine rescue cars which are in progress of construction. The cars will be stationed at Butte, Mont.; Reno, Nev., and Raton, N. M. The Butte car will be assigned to Montana, Wyoming and Idaho. The territory of the Reno car will be Nevada, Utah and part of California. The Raton car will be used principally in New Mexico, Colorado and Arizona.

These cars, which will be of all-steel construction, eighty feet long, are the last word in equipment designed for this use. While the cars are primarily to be of service in mine rescue work, an important feature of their use will be of an educational nature. The cars will be sent to mining camps, where their expert personnel will offer advice to mine operators and give instruction in mine rescue and first-aid work.

Each car will have a complement consisting of a mining engineer, who will be in charge; a mine surgeon; a foreman miner; a first-aid miner; a clerk and a cook. It is expected to keep the cars on tours during at least ten months of the year. Stops will be made in every mining camp, where enough persons are engaged in the industry to make it practicable. At each of these stops the mining engineer will confer with the mine operators of the district and, if they will permit, will look over their mines with the idea of making recommendations toward improvements which will tend to increase safety or promote conservation. The surgeon will investigate the sanitary and health conditions in the camp and make recommendations for their improvement, if it should be necessary. The foreman and first-aid miners will form classes among the operatives for instruction in mine rescue and first-aid work.

Each of the new cars is equipped with a moving picture apparatus and with stereopticons, which will enable the men to give lectures to the general public in each mining camp on subjects looking to the improvement of conditions and making possible increased safety.

While a general territory has been assigned to each car, it is not the intention to lay down any hard and fast recommendations as to where the cars may go. This would be true especially in case of a disaster. If an accident should take place in

any mine, the car which could reach the scene quickest would be dispatched.

The usefulness of the mine rescue cars has been increased greatly by the cooperation of the railroads. Practically all railroads in the mining regions have agreed to haul the bureau's mine rescue cars gratis.

The three new cars were to have been ready for service February 1, but owing to the congested state of practically all industrial establishments it has been necessary to permit the manufacturers to have more time to make delivery.

### SUPREME COURT REFUSES TO HALT COAL MINE SUIT

Postponing final action as to whether labor unions may be sued for treble damages under the Sherman anti-trust law, the Supreme Court of the United States has refused to interfere with trials ordered in Arkansas of suits for \$1,283,000 damages brought against the United Mine Workers' Union by the Coronado and other Arkansas coal companies.

After trial another appeal may be brought to the Supreme Court.

A writ of prohibition, sought by the union, to prevent Federal Judge Youmans of Arkansas from proceeding with the trial of the coal companies' action pending Supreme Court review of legal questions involved, also was denied.

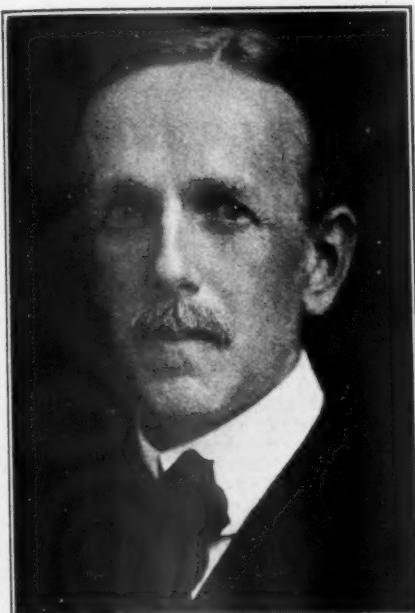
In asking Supreme Court review the union claimed exemption from litigation, denying that the Sherman law contemplates suits against unions.

Denial of review requested, the union contended, would put it to great expense in defending the Arkansas litigation and also set a precedent for other suits against unions, with possible attachment of union property. The coal companies contended that the union should appeal to the Supreme Court only after trial in Arkansas and a final decision there.

### Rice Heads Committee

George S. Rice, chief mining engineer of the Bureau of Mines, has been made chairman of the Standardization Committee of the mine section of the National Safety Council. This committee will study accident statistics, ropes and safety devices, mine hygiene and sanitation, mine fire prevention, mine fire fighting, mine rescue, first aid and mine rescue contests.

**GOVERNMENT EXPERTS WELL  
KNOWN TO MINING MEN**



N. H. DARTON  
Geologist

N. H. Darton has been a geologist in the U. S. Geological Survey since early in 1886. He has investigated the geology of many portions of the country and published numerous reports. Some early work was on the Atlantic Coastal Plain, the Florida phosphates and the geology of the regions about Washington, Philadelphia, Richmond, New York, Trenton, Baltimore and Fredericksburg. He prepared the greater part of the geologic map of New York State published by the Survey in 1894.

Later the geology of the Central Great Plains was made the subject of an extensive report. Researches were also made in the Black Hills, Badlands, Bighorn Mountains, Rocky Mountain Front and the Southeastern Colorado region. A geologic reconnaissance was extended across New Mexico and Arizona, including a preliminary geologic map of the Grand Canyon, and later this work, with additional study, served as a basis for a guide book to the geology along the Santa Fe Railroad, which the superintendent of

documents has recently reported to be the Survey's "best seller."

Mr. Darton's latest work has been studies of geology of New Mexico, especially of the great series of "red beds" and their prospects for potash. As a result of this study a site was selected for a deep boring now in progress, to explore for potash the salt deposits underlying Northern Texas.

Although Mr. Darton has reported on a great variety of economic resources, his special interest for many years has been artesian waters, and he has made numerous predictions as to deep well prospects in various regions. These forecasts have been verified in a most impressive manner and a large amount of water obtained for municipal, irrigation, railroad and domestic use. One notable prediction was for 3,000 feet at Edgemont, S. D., where at 2,963 feet a daily flow of 500,000 gallons was found. Other predictions in the Southwest have yielded water for the Santa Fe Railroad at several places. From 1896 to 1907 he was in charge of underground water investigations in the Survey mainly in the West, and with various assistants brought together a great fund of facts bearing on this important resource.

From 1910 to 1913 Mr. Darton, as geologist of the Bureau of Mines, investigated the occurrence of explosive gases in coal mines in Pennsylvania and Illinois. The result was his report published as Bureau of Mines Bulletin No. 72. In this connection he also prepared a contour map showing the structure of the northern anthracite coal fields.

Mr. Darton is author in whole or in part of twenty-seven of the folios of the Geological Survey, five professional papers, ten water supply papers, twenty bulletins, four papers in annual reports and some special maps and other publications, besides many articles in scientific and popular journals. Mr. Darton is a member and fellow of many scientific societies here and abroad, including several geological societies, the Institute of Mining Engineers and the Mining and Metallurgical Society.

**PAINT MANUFACTURERS APPEAL  
TO THE BUREAU OF MINES**

Paint manufacturers in the United States are uneasy, fearing that some development in the war situation may cut them off from their supply of chalk. Chalk, which is imported to the extent of 200,000 tons annually, comes largely from Dover, England. It is used principally for sizing paints and in the manufacture of putty. It is feared that the demand for high-class chalk could not be met immediately in the United States in case something should interfere with importations. The matter has been called to the attention of the Bureau of Mines and its division of mining technology is looking into the matter.

**PHILLIP N. MOORE ELECTED  
TO HEAD MINING ENGINEERS**

Mr. Phillip N. Moore, of St. Louis, has been elected president of the American Institute of Mining Engineers for the ensuing year.

The annual report of the retiring president, Dr. L. D. Ricketts, shows a substantial growth of membership during the past year and very marked advancement in all lines of the work. A very substantial contribution was made by Dr. James Douglass for the extension of the library of the united societies.

The annual reception and banquet held at the Hotel Astor was largely attended. The discussions of the meetings were of great merit and the one hundredth and fourteenth meeting of the institute was one of the best in its history.

Means for conserving the country's phosphate rock deposits, the latest developments in flotation and the commercial use of potash as a blast furnace by-product were a few of the important subjects taken up by the American Institute of Mining Engineers in their sessions in New York, February 20.

The cream of the phosphate rock production of the country, according to Dr. W. C. Phalen, of the U. S. Bureau of Mines, has been wastefully depleted because of a preference shown for European exporting over American fertilizer manufacturers. Phosphate rock deposits are now found in nine different States and Dr. Phalen stated that the exportation of high-grade rock during the past ten years averaged close to half of the country's output.

In discussing the year's development of the flotation process J. M. Callow, of Salt Lake City, declared that the results obtained by pneumatic flotation on all classes of ores establish the advantages of this method over the so-called agitation process. The experiments of many of the leading copper companies of the West were cited by Mr. Callow as indicative of the success of flotation processes.

Many large industrial and mining companies of the country are united this week in contributing the intimate results of experiments which have proved profitable in the past year. A striking example of this was shown in a detailed explanation by R. J. Wysor, of Bethlehem Steel Company, of the marketing of potash as a by-product from the blast furnace.

The general subjects discussed February 20, were non-metallic minerals, iron blast-furnace practice and flotation. The Institute's annual dinner, at which President L. D. Ricketts acted as toastmaster, was a great success. The dinner was in honor of Herbert C. Hoover, a vice-president of the Institute and distinguished during the past two years as head of the Belgian Relief Commission.

The engineer put on his war bonnet February 21, and discussed preparedness with the Naval Consulting Board. The immediate subject was the erosion, or the hardening of the surface of guns.

In an effort to increase the life and efficiency

of guns the Naval Consulting Board met with the Institute members. Many of the country's leading scientists were in attendance and a committee headed by Dr. Hudson Maxim led the discussion. Dr. Henry Fay, of the Massachusetts Institute of Technology, presented the results of experiments showing the damage done by erosion.

The interest of the mining engineers in the country's military preparedness was further demonstrated February 22, when the convention moved by special train to West Point for an inspection of the Military Academy equipment.

A report of the Institute Committee on Safety and Sanitation showed that mining companies in every section of the country are taking every possible precaution for the avoidance of accident and to encourage the safety first education of the employe. This movement, it was noted, has in recent years assumed tremendous proportions with favorable results both to the employe and the mine operator. The Convention formally studied the facts attendant upon the Pennsylvania Mine fire at Butte, Montana, which cost the lives of twenty-one men.

The first public exhibition of technicolor standard films in natural color was given before the Institute members. This was but one of the many social features provided for the members and their wives during the week's sessions.

The next meeting of the American Institute of Mining Engineers will be held in St. Louis and in the mining districts of Missouri, Kansas and Oklahoma in September.

**FRANCIS C. RYAN  
APPOINTED ELECTRO-METALLURGIST AT SEATTLE**

One of the principal activities of the mine experiment station at Seattle will be along the lines of electro-metallurgy. For this reason more than usual interest surrounds the recent appointment of Francis C. Ryan, of Harrisburg, Pa., to the post of electro-metallurgist at Seattle. Mr. Ryan is a graduate of Lehigh University. The major portion of his experience has been with the United States Smelting Company in its electrolytic refineries. He is 33 years of age. His salary will be \$2,400.

**Report on Safety Conditions**

A coal mine near Pittsburgh, Pa., by request of the operators, was examined by J. J. Rutledge and E. H. Denny, of the Bureau of Mines, as to safety conditions. A comprehensive inspection was made, and the mine completely sampled, coal, dust and air samples being taken. An oral report of conditions, together with recommendations, was made to the company officials.

SUMMARY OF PRINCIPAL WITHDRAWALS AND RESTORATIONS DURING THE PERIOD MARCH 4, 1913,  
TO JANUARY 31, 1917. (IN ACRES)

	<i>Outstanding withdrawn March 4, 1913</i>	<i>Withdrawn during period</i>	<i>Restored during period</i>	<i>Outstanding withdrawn January 31, 1917</i>
Coal.....	65,410,464	669,304	20,850,618	45,229,150
Oil and gas.....	4,817,706	2,312,899	692,397	6,438,208
Phosphate.....	3,367,378	489,601	1,350,581	2,506,398
Potash.....	133,829	211,384	214,584	130,629
Power site.....	1,857,258	772,767	199,299	2,430,726
Public water.....	86,216	117,782	3,022	200,976
Total.....	75,672,851	4,573,737	23,310,501	56,936,087

**TO CLASSIFY COAL MINES  
ON RAILROAD BASIS**

Matters involving cooperation with the War and Navy Departments, in case of war, have occupied much of the attention of officials in Washington during the past month. The Geological Survey and the Bureau of Mines are in positions to be of special service in case it became necessary to mobilize the mineral industries of the country so as to insure a maximum of efficiency.

That it will be necessary for the Government to regulate coal production, much after the manner found necessary in the belligerent countries of Europe, is not doubted. The only complete information as to the producers of coal, and of other minerals, is possessed by the Geological Survey. It can be seen that very early after the opening of hostilities the War Department would have to call upon the Geological Survey for a great deal of information in connection with the coal supply. The Survey also has complete information as to the sources of supply for the by-product ovens of the country. One of the first steps that would have to be taken in case of war would be an arrangement whereby the by-product ovens could be kept continuously supplied with coal.

In order to have this information in another form which would be of especial service in case of war, and from the fact that the information is desirable anyway, the Survey is recompiling its list of coal mines on a railroad basis. At present this information could not be obtained without considerable difficulty. The data always have been classified by States.

**COKE BULLETIN FOUND TO BE  
OF ESPECIAL VALUE**

The H. Koppers Co., commenting on C. E. Lesher's recent coke bulletin says, "We have gone over this bulletin carefully and will say that it is the best and most complete publication on this subject ever made by the Geological Survey.

"Your new efforts in the shape of charts and diagrams and your chapter on the distribution of the consumption of coke are especially valuable." Mr. Lesher, the author of the bulletin, is the statistician of the Geological Survey.

**BUREAU OF MINES INVESTIGATES  
OILS FROM WOOD WASTE**

Oil from waste wood secured in the wood distillation industry may soon come into competition with many coal tar products now in use. In cooperation with the Bureau of Mines, the Forest Products Laboratory recently completed a number of tests at Salt Lake City to determine the value of certain wood oils for the flotation process. Excellent results were obtained and it appears very probable that these oils will be placed on the market in competition with many coal tar products now in general use. Some of these wood products, which at present have practically no market value, will become a source of revenue to the wood distilling industry.

In producing paper pulp from longleaf pine timber a quantity of turpentine is driven from the wood. This turpentine is adulterated to such an extent that it is usually of little or no commercial value. Recently, however, a method has been developed by the laboratory whereby sulphate turpentine from Southern pine can be purified and made as acceptable to consumers as gum turpentine. Tests of the process on a commercial scale will be made very soon at one of the large paper mills in the South.

Recent experiments with sodium fluoride by the laboratory are directly responsible for a marked demand for that chemical. A number of lumber companies are experimenting with it in large quantities as a sap stain preventative, in which respect it has proven much more effective than sodium carbonate, which is generally used for this purpose. One mining company is now using it for the preservation of mine timbers and a railroad company treating over a million ties per year is seriously considering its use in place of zinc chloride.

**Added to Committee**

Walter Douglas, president of the American Mining Congress, has been appointed by Van H. Manning a member of the committee which will draft a new mining code for submission to the Congress of the United States. Mr. Douglas will take the place of his father, Dr. James Douglas, on the committee. Dr. Douglas was prevented from serving due to ill health.

## BUREAU OF MINES WOULD SUPERVISE USE OF GOVERNMENT FUEL

George S. Pope Appears before Committee on Mines and Mining of the House of Representatives and Explains how Great Saving Can Be Effected by Bureau's Engineers

"The annual coal purchases of the Government amount to between \$7,000,000 and \$8,000,000. This fuel is selected and used sometimes in the most satisfactory manner, but frequently in ways inefficient and wasteful," said Geo. S. Pope, of the Bureau of Mines, to the House Committee on Mines and Mining last month. Continuing, he said: "The supervision of its use is sometimes expert, but is often far from satisfactory, so that engineers competent to judge are of the opinion that the practices of the Government in the economical use of its fuel are open to improvement of the same order of magnitude as have been realized by many larger users of fuel when centralized, persistent effort has been made to reduce fuel costs. A saving as moderate as 10 per cent, which is believed to be well within a reasonable expectation, indicates the magnitude of the sum involved. There is at present waste in the selection of fuels, waste due to inefficient design of equipment, and waste in the manipulation of the fires. There is a lack of expert instruction given to the man firing the fuel, a frequent lack of information by plant managers as to what other plants are attaining, and a lack of knowledge of standards by which to measure actual performance.

"There are several ways whereby the Government can readily improve on its methods of selecting, purchasing, supplying, and using fuel at its various institutions. A large saving can be effected by selecting fuel with special attention to quality and cost. In considering the factor of cost, it becomes necessary to consider not only the cost of the fuel at the mine, or the cost of fuel delivered at the point of consumption, but also the saving which can be made in cost of transportation by the shipment of this fuel over land-grant transportation lines. I would like to mention later something in detail relating to the subject of land-grant transportation.

"In order to determine the cost of fuel with respect to quality, it becomes necessary to reduce the same to a common standard of calorific value, that is, the cost per 1,000,000 British thermal units. This, however, while being an important factor, must not be the only criterion in the selection of fuel for any specific purpose. After the cheapest fuel has been determined upon on the calorific value basis, it becomes necessary to make further analysis of the same for physical and chemical properties, to determine its fitness for use for any special purpose, and the efficiency with which such fuel can be

utilized in the fuel-burning equipment which may be in use, or which can be provided to the best advantage. By processes of elimination the most efficient and economical fuel for use for any particular purpose can be determined upon. This is, perhaps, the most important work in connection with the selection, purchase, and supply of fuel for government use, and is the type of work for which the Bureau of Mines is infinitely better equipped than any other bureau of the Government. Such work requires the services of fuel engineers who have made practical and scientific investigations in the combustion of fuel, and who are experienced in all phases of the art. Fuel for all Government departments, with possibly one exception, the Navy Department, may be selected by persons who do not possess any special knowledge in any branch of the art; hence it is only logical to assume that much improvement would result if the work could be done under the supervision and advice of engineers specially trained for such work. The Government has appropriated large sums of money annually to the Bureau of Mines for the express purpose of testing fuel with a view to securing a better understanding of fuel characteristics and the proper combustion and economical use of the same. While the information obtained has been made available to the public in the form of bulletins from time to time, yet it is found that much of the information given out by the Bureau is not applied in the management of Government plants.

"The Bureau of Mines is prepared to serve in a broader field of endeavor, namely, the application of its results to the practical side of the selection, purchase, and use of fuel by the United States Government. The experimental work carried on during the several years past by the Bureau of Mines has developed to a remarkable degree, a better understanding of the processes of combustion, and the application of certain methods of treatment and use of fuels to produce the highest efficiency. As fuel becomes more and more scarce, and the cost of production increases, the cost of fuel to the consumer must necessarily increase, making it more and more important that fuel be selected and used with the highest degree of efficiency.

"This is an age of specialists. If water comes through the roof of our house, we do not send for a laborer to relieve us of our troubles, we send for a tinner, who makes this work a specialty. If we suspect a leak in our plumbing system, we do not call upon the carpenter, the

plasterer, or the steam fitter. We send for a plumber. If we suspect still some other type of leak, we may call upon a lawyer. When we suspect that we are not getting full value received for Government moneys expended for our fuel supply, why should we not call upon the expert fuel engineer, who has especially fitted himself for this art, to find out where such leak exists, and to recommend the proper remedy.

"Commercial enterprises appreciate more fully every year the knowledge possessed by the experts of the Bureau of Mines in the fuel industry, and the assistance which the bureau is prepared to render in solving their fuel problems. Commercial enterprises are calling upon the bureau constantly for advice and assistance in this work. Government departments do not seek this assistance of the Bureau of Mines to the same degree. Why? Anyone employed in the Government service for any length of time will readily appreciate the answer. This unfortunate condition is brought about simply because when a man is assigned to a certain line of work, he does the same to the best of his ability and makes an effort to convince his superior that he is making a success of his assignment. If he is especially industrious, he may endeavor to make a study of his line of work outside of his hours of employment. He may be doing very good work, considering the training which he has had for the work, but it is not reasonable to suppose that he can become as efficient as the engineer who has made a study of a particular phase of the work. His success with his superior depends largely on what he can make him think he is doing. The employee is naturally loathe to have any expert in his particular line take any action or to recommend any change which will at all reflect on the character of his work. He resents any suggestions in this regard.

"If you were to call upon various Government departments and their branches for any expression regarding the advisability of such action as proposed in this bill, you would probably find that a majority of such departments would take a broad view of the subject, and not allow personal considerations to predominate when it was realized that the Government would be greatly benefited financially. You would in all probability, however, find a few branches of the Government service which would express general disapproval for the very reasons herein set forth. I have known of certain branches of Government departments stating that they have expert engineers who handle their fuel problems. I know of one branch of a department in particular, which if called upon for a statement on this subject, would probably claim to have a corps of expert engineers for this special work. I have positive information to the effect that this particular branch of the service has not at the present time, nor has had for months past, one single fuel engineer to pass judgment on its fuel purchases, which amount annually to over \$1,500,000.

"In this connection it may be stated that the Government has aided practically all railroad companies throughout the central and western

States in the construction of their transportation lines by the granting of public land and otherwise rendering financial assistance. In consideration thereof it has been agreed that the Government shall receive certain reduced tariffs on passenger service and freight shipments. Such reductions therein amount to from a few per cent of the regular rate to a hundred per cent. Transportation charges on coal form perhaps a larger percentage of its total cost than on almost any other commodity used by the Government, and the transportation of coal should therefore be a prime consideration. On the contrary, many offices charged with the supply of fuel neglect this consideration entirely. There is a great tendency to follow precedent in all Government transactions, and only the more courageous Government officials will venture to make a change.

"As stated in the previous hearing, the Bureau of Mines cannot instruct, but can act only in an advisory capacity, and our advice may be followed or not, as the department concerned may see fit. At the present time the Bureau has no power by which it can compel the various departments of the Government to follow the instructions of the Bureau. In order to secure this there must be some compelling force back of some agency of this kind, so that when the employees of the Bureau of Mines go into a plant and make their investigation we can see that their recommendations are carried out in a proper way, and not allow the continuance of a method by which the fireman is left to be the judge."

#### COAL PRODUCTION FROM MANY NEW SOURCES REPORTED

As a result of the increased activity in coal mining, the statistical division of the Geological Survey is being taxed to keep up with new production. Many new mines are being opened. Old mines which have been shut down for years again are being worked, while much coal is being loaded from slack piles. Since much of this new production comes from small producers it is extremely difficult to keep up with this new production, but due to the very excellent system, which has been perfected through many years by the Survey, it is believed that little or none of this production is escaping tabulation.

#### Why Statistics Vary

There are several reasons for the slight variations which appear in statistics as compiled by the Geological Survey and by the individual States. For instance, Colorado includes waste in its figures showing the total amount of coal produced. On the other hand, the State of Washington excludes waste. Various minor practices of this character cause slight differences in totals.

## BUREAU OF MINES TO HAVE STATIONS AT MOSCOW AND CORVALLIS

Cooperative Agreement Signed with the University of Idaho and with the Oregon State Bureau of Mines and Geology—Consulting Metallurgists Named to Take Charge of Work

Through cooperative agreements with the University of Idaho and the Oregon Bureau of Mines and Geology, it has been possible for the Bureau of Mines to provide for two new and important stations. One will be at Moscow, Idaho, and the other at Corvallis, Ore. As the other contracting party furnishes the Bureau of Mines with offices, laboratory equipment and various facilities, including personal services, it makes it possible for the bureau to use its entire appropriation for this work for actual experimentation. In fact, it makes it possible for the bureau to double the amount of work it would be able to do at a station operated solely by the bureau.

E. K. Soper and Robert R. Goodrich have received appointments as consulting metallurgists and will be in direct charge of the work conducted at the Moscow station. Will H. Coghill also has received an appointment as a consulting metallurgist of the bureau and will be in charge of the work at Corvallis. He will be assisted by Arthur M. Schwartley, who has just been made an assistant metallurgist of the bureau.

Fellowships in metallurgy have proven to be an important outgrowth of the cooperative agreement with the University of Utah. These fellowships have been so advantageous to the University and to the Bureau of Mines that it is probable that arrangements for them will be made at each of the other stations. In some cases the matter of fellowships will depend upon contributions by local mining companies.

### HAZARDS OF MINING SHOWN BY LEGISLATIVE ACTIVITY

"Nothing more clearly accentuates the hazard of the mining industry than does a review of legislative activities with respect to it. The protection of the men who dig in the dark underground for the raw materials from which all modern industry is constructed, has long been a matter of state and federal concern, surpassing even that accorded ocean and railway transportation. Safety in mining has always received the attention rightly due of the most hazardous of all the industries. Due to the high relative accident ratio in mining, this industry was one of the first to receive state and federal assistance for the purpose of increasing the safety of the workmen." (Extract from address made by Herbert M. Wilson.)

### POTASH PROSPECTING GOES AHEAD RAPIDLY AT CLIFFSIDE

Satisfactory progress is being made in the drilling being conducted by the Geological Survey at Cliffside in its effort to discover deposits of potash. The drill is now approaching the big salt bed which is reached at a depth of 725 feet.

Owing to the similarity between conditions in the red beds area of the Southwest and that of the area in which the German potash deposits are found, the Geological Survey is undertaking to prospect this region in the hope of developing a domestic supply of soluble potassium salts. While the general conditions are the same under which the German potash deposits were laid down, it is recognized that the essential minor conditions which would be necessary to such a deposit may not exist in the Cliffside region. It is known that there was a great inland sea in that part of the United States and that it was largely taken up by evaporation. It has not been established if it evaporated to the last dregs. Even after the great salt beds had been laid down it is recognized that drainage may have been accomplished and that the highly soluble potash salts, which would be among the last ingredients of the water to be laid down, may have escaped. There are geological evidences however, that the center of the maximum evaporation was at Cliffside where the Survey is conducting its drilling operations.

### LUMINESCENCE EXHIBITED BY NUMEROUS SUBSTANCES

The property of triboluminescence exhibited by zinc blende is not confined to that mineral, but is shown by diamonds, sugar, quartz, dolomite, and several organic compounds, according to the Geological Survey. Probably, also a number of other substances are triboluminescent. This property is a variety of the general phenomenon of luminescence which is exhibited by many substances, such as the photoluminescence of fluorspar, the thermoluminescence of scheelite, the electroluminescence of some rarefied gases, and various other forms of luminescence. The property of triboluminescence is shown rather faintly when two cubes of loaf sugar are rubbed together in the dark.

Triboluminescence is a property inherent in certain substances. No satisfactory explanation for it has been offered.

**SAYS FATALITY RATE CAN BE  
REDUCED BY TWO-THIRDS**

"That it is possible to reduce the fatality ratio for the mines of the United States to one-third the present rate is evidenced by the great reduction in accident frequency effected in the coal mines controlled by the United States Steel Corporation through its Department of Safety. The methods and the result of this work have blazed the way for others to follow. For example, in the most dangerous coal field we have, in the Pittsburgh District of Pennsylvania, the accident ratio of the large group of mines operated by the H. C. Frick Coke Company was, a few years ago, as great as that in neighboring mines operated by other companies. A year ago the fatality rate in the mines of this company was 1.52 per 1,000 employed, as compared with a rate of 2.36 per 1,000 of underground workers in neighboring mines. In the West Virginia mines of another subsidiary of this corporation, namely, the United States Coal & Coke Company, the fatality rate last year was 0.75 per 1,000 employees, compared with the average for the state of 7.94." (Extract from address by H. M. Wilson.)

**To Go to Chile.**

Waldemar Lindgren, head of the department of geology of the Massachusetts Institute of Technology, has advised the Geological Survey that he will leave soon for the Braden copper mines in Chile, where he will spend several months doing geological work.

**FEDERAL RESERVE BANKS  
REPORT ON MINING INDUSTRY**

The Federal Reserve Board has received the following comment on the mining industry from the managers of the regional banks:

Kansas City.—Colorado's metal output for 1916 sets a new record for the industry in that State. The value of five metals only, i. e., gold, silver, copper, lead, and spelter, exceeding the value of 1915 by more than 25 per cent, although the past season was not favorable to the production of gold, the cost of mining per ounce, placers excepted, being rated at the highest in the annals of the industry. Reliable figures show that the value of zinc, lead, and calamine ores produced in the Missouri-Kansas-Oklahoma district for 1916 exceeds the total of 1915 by 34 per cent. The new year opens auspiciously for continued prosperity in the mining industry with active work in the developing of prospects.

Rapid advances in the price of crude oil in the Kansas and Oklahoma fields have continued, the quotation now standing at \$1.70 per barrel with expectation of further increases. The present price is the highest ever posted in these fields. Owing to this increase much new work is being planned, but is seriously delayed by lack of water for drilling purposes. Leasing is exceedingly active.

There has been some threatened disturbance among the laborers in the coal fields in Colorado, but this is purely local in character. Labor conditions may be said to be better than normal for this season of the year.

Minneapolis.—Mining operations for the coming season will be very active. Northern Minnesota concerns are holding their forces together as well as they can by employing men on stripping work and other winter operations in anticipation of a record season. In the copper-mining districts of northern Michigan and Montana production is still maintaining record figures, and the mines expect during 1917 to make a large increase over the remarkable figures of last year.

Dallas.—The advance in the prices of crude petroleum has stimulated business in the oil fields, and conditions are reported satisfactory. The movement of refined oil from Port Arthur in December was heavier than in the month previous and has contributed to make an unusually profitable season at that port. The scarcity of coal continues to be felt and has caused a heavy advance in prices. Reports from Oklahoma are that a few of the mines have opened and it is believed that the remainder will soon do so. It is expected that the controversy over the wage situation will soon be settled and normal conditions in the mining districts resumed.

Atlanta.—The mining industry in the Birmingham district is now regarded as satisfactory to the operators. The car shortage is greatly lessened. Consumers are in the market for renewal of contracts that expire in the main on July 1, the contract period. There is a great demand for all miners and mine laborers, not only in coal mining but in ore, limestone, and quarries. Some laborers are still leaving the district for northern labor markets. Prospects for profits in the coal industry are better than for many years.

Cleveland.—Oil and coal producers report splendid business to the extent that deliveries can be made. There is still an acute demand for labor of all grades, yet on account of the car shortage in the coal regions there is some restlessness because of inability to continue employed full time.

**Joins Bureau of Mines Staff**

J. W. Kingsbury, of Salt Lake City, son of the former president of the University of Utah, has been added to the staff of the Bureau of Mines. He has been assigned to duty as assistant to Albert H. Fay in the statistical division.

**Hess Off on Long Trip**

Frank L. Hess, of the United States Geological Survey, has left Washington on an extended trip during which he will look closely into the situation of the rarer metals in Colorado, New Mexico, Arizona, California, Nevada, Utah and Washington.

**GOVERNMENT EXPERTS WELL KNOWN TO MINING MEN**



JOSEPH B. UMPLEBY  
Geologist

Joseph B. Umpleby was born in Graysville, Ohio, in 1883. He received his elementary education in the grammar schools of California, and later he attended Ohio Wesleyan University, the University of Washington, and the University of Chicago, where in 1910 he received the degree of doctor of philosophy, *magna cum laude*. He became a member of the United States Geological Survey in 1907 and has been engaged principally in the examination of mining districts.

Dr. Umpleby has reported on the Republic and Oroville-Nighthawk districts of Washington for the state geological survey. His work on the Federal survey has included a season as assistant to Dr. F. L. Ransome in the detailed investigation of the Ray and Miami districts, Arizona, one summer in the Judith Basin coal field, Montana, and another in examining certain coal deposits of the Cascade Mountains. Since 1910 he has been engaged in a study of the mining districts of Idaho, in preparation for a comprehensive report on the ore deposits of the State. As this State is unique among the Western States, in that it embraces within itself a com-

bined physiographic, petrographic, and orographic province, it is probable that these studies will lead to conclusions of more than ordinary interest. Dr. Umpleby has already published a number of official reports on the ore deposits of parts of Idaho and has contributed several articles to technical journals. Among these the most important is his discussion of the genesis of the Mackay copper deposits, as these deposits are rather exceptional in admitting of almost rigorous proof that they were formed by magmatic emanations.

Dr. Umpleby served two years as geologist on the Geological Survey of Washington, and for one year (1915-1916) while on leave from the Federal survey was acting associate professor of geology in the University of California. He is a member of several geological societies and of the American Institute of Mining Engineers.

**BUREAU OF MINES LISTS ITS LATEST PUBLICATIONS**

Announcement that the following publications are ready for distribution has been made by the Bureau of Mines:

Bulletin 122. The principles and practice of sampling metallic metallurgical materials, with special reference to the sampling of copper bullion, by Edward Keller. 1916. 102 pp., 13 pls., 31 figs.

Bulletin 128. Refining and utilization of Georgia kaolins, by Ira E. Sproat. 1916. 59 pp., 5 pls., 11 figs.

Technical Paper 137. Combustion in the fuel bed of hand-fired furnaces, by Henry Kreisinger, F. K. Ovitz, and C. E. Augustine. 1916. 76 pp., 2 pls., 21 figs.

Technical Paper 138. Suggested safety rules for installing and using electrical equipment in bituminous coal mines, by H. H. Clark and C. M. Means. 1916. 29 pp.

Technical Paper 164. Accidents at metallurgical works in the United States during the calendar year 1915, compiled by A. H. Fay. 1916. 20 pp.

Miners' Circular 23. Elementary first aid for the miner, by W. A. Lynott and D. Harrington. 1916. 23 pp., 19 figs.

Note.—Only a limited supply of these publications is available for free distribution, and applicants are asked to cooperate in insuring an equitable distribution by selecting publications that are of especial interest. Requests for all papers cannot be granted. Publications should be ordered by number and title. Applications should be addressed to the Director of the Bureau of Mines, Washington, D. C.

**To Study Rochester District**

Adolph Knopf, of the United States Geological Survey, left last month for the Rochester district of Nevada, where he will make a detailed geological survey of the more centrally located portion of that mining district. He will be engaged three months on this work.

**DRAFT OF NEW MINING  
CODE WANTED BY SEPT. 1**

If prompt action is obtained on the bill to revise the mining laws at the next session of Congress it will be necessary to have the bill ready by September 1, Representative Taylor, of Colorado, believes. He also points out that the senators and representatives of the mining States must have a draft of the bill in time to submit it to some of their constituents so as to secure their opinion on it before returning to Washington. To insure the study of the bill by a considerable number of persons in each of the mining districts it will be necessary, Mr. Taylor believes, to have not less than three months time for this to be done.

Mr. Taylor has been advocating a revision of the mining laws for a number of years. It is his personal opinion that a commission should visit every mining region of the country, so as to secure a better idea of the needs of all mining districts before attempting any drastic change in the present law. Since the commission idea has met with decided opposition in Congress, Representative Taylor is not averse to the plan of having a bill formulated by Van H. Manning, of the Bureau of Mines, in conjunction with W. R. Ingalls, L. D. Ricketts, J. R. Finlay, J. Parke Channing, Hennen Jennings and John Hays Hammond and Walter Douglas. He has a high opinion of the ability of these men, but sounds a note of caution in suggesting that the greatest care must be used not to allow theoretical conditions to govern their action to too great an extent. He declares the man with the burro must be considered. He also hopes that it will be possible to remedy the glaring defects in the mining code without tearing up the entire statute. He believes the changes should be held to a minimum.

**SUPERIOR MILLING METHODS  
ACCOMPLISH WONDERS AT TYRONE**

Sidney Paige, who is in charge of western areal geology for the Geological Survey, sees in the Tyrone district of New Mexico an example of what can be accomplished on low-grade secondarily enriched chalcocite deposits by underground mining. A few years ago it would have seemed impossible that conditions ever would exist which would permit of such extensive operations in such low-grade ore. Superior milling methods and the increase in price have been mainly responsible for the great success of mining operations in the Tyrone district. Mr. Paige thinks it possible that the physiographic history of the region may throw light on the several periods of enrichment. These aspects of geology which might appear to be purely scientific may prove of direct economic value, he points out.

The Union Zinc Co., Knoxville, Tenn., are enlarging their mill and have just given the Denver Quartz Mill & Crusher Co. a hurry-up order for a Denver Quartz mill.

**SURVEY MEETS DEMAND FOR  
DETAILED COAL STATEMENT**

In the Geological Survey's monthly coal statement, which is about to follow, it will be noticed that more detail is shown than has been the case previously. Beginning with this statement the Survey will attempt to meet as completely as possible the demand for more detailed information in this regard. The groupings are arbitrary as the Survey must depend for its information upon the railroads. On the Baltimore & Ohio Railroad, for instance, coal is originated in several States, which makes it necessary to show all of these States in the same group. The statement is as follows:

Carloads of bituminous coal that originated on fifty three railroads and of beehive coke on eleven roads in January, 1917, as compiled from reports received by the Geological Survey, Department of the Interior, by noon, February 15, 1917:

	<i>January</i>	<i>December</i>	<i>January</i>
	1917	1916	1916
Number of working days.....	26	25	25
Carloads of bituminous coal, Pennsylvania (15 roads).....	188,161	173,914	204,417
West Virginia, Virginia, Maryland, and Ohio (11 roads).....	200,560	188,751	190,440
Illinois and Indiana (13 roads).....	143,475	128,891	137,327
Kentucky and Alabama (6 roads) ..	18,930	17,152	15,471
Iowa, Texas, Colorado and Southwestern States (8 roads).....	22,590	20,197	19,900
Fifty-three roads... .	573,716	528,905	567,555
Carloads of beehive coke (11 roads) ..	64,669	62,952	69,902

The increase in shipments of bituminous coal in January, 1917, compared with December, 1916, was 8.5 per cent, and compared with January, 1916, was 1.1 per cent. The average number of cars of coal per working day was 22,062 in January, 1917, against 21,152 in December, 1916, and 22,701 cars in January, 1916. These statistics indicate that although shipments in January, 1917, were greater than in December, 1916, in all the five States or groups of States, and were greater than in January, 1916, in all the groups shown except Pennsylvania, the average daily rate of production is now less than a year ago, but is above that for December, 1916, which in turn was below that for November, 1916.

The shipments of beehive coke in January, 1917, showed an increase of 2.7 per cent compared with December, 1916, and a decrease of 8 per cent compared with January, 1916.



PUBLISHED EACH MONTH BY  
THE AMERICAN MINING CONGRESS.  
Munsey Building. Washington, D. C.

Subscription Rate, per year.....	\$2.00
Single Copies.....	.20

Entered as Second Class Matter January 30, 1915,  
at the Postoffice at Washington, D. C.

MARCH, 1917

#### TAXES SCARE CAPITAL AWAY FROM COLOMBIA

Conditions in Colombia are such as to be very discouraging to the American oil and mining men, according to G. S. Rogers of the United Geological Survey, who has just returned from a five-months visit to the South American republic.

"The whole atmosphere in Colombia," declares Mr. Rogers, "is discouraging to development. There is a general tendency to tax industry. In most cases the amount of taxation is out of proportion with the chances of profitable exploitation of resources, especially when their extent is unknown. While there are many seepages of oil, it is known that the anticlines are badly shattered in many cases and some authorities doubt if development will bring in any important supplies of petroleum."

It seems to be the almost unanimous opinion of engineers returning from Colombia that it is very poor place for American capital to look for investment. The public there seems to look upon Americans as legitimate objects of all manner of extortions. There is a tendency among the lawmakers of the country to regard foreign enterprises as the best source of revenue. Transportation facilities are very poor and there is little tendency on the part of the government to develop these facilities for its own account.

While it is known that the mineral resources of the country are of sufficient importance to justify development under fair conditions, the general conclusion seems to be that there must be a revolutionary change of public sentiment in Colombia before American investments can be recommended.

#### DIVISION OF MILITARY SURVEYS TO AID WAR DEPARTMENT

An important development connected with the topographic work of the Geological Survey is the larger use now made of the published maps. The increasing number of map users is bringing new demands upon the Topographic Branch, the most important of which is that of having the topographic surveys meet the special requirements of the army. Within the last year or two, cooperation between the War Department and the Geological Survey has been more active than ever before, and further progress in this cooperation will be promoted by definite recognition in the Survey organization of this phase of topographic work.

Glenn S. Smith is credited with much that already has been accomplished, and will be in charge of the Division of Military Surveys created last month. This division is of coordinate rank with the five geographic divisions, but the chief of the new division will cooperate in a special way with each of the other division chiefs. In whatever degree the topographic survey of any area is intended to meet the needs of the War Department, the field and office work will be administered directly by the chief of the division under which that area comes geographically, but the supervision of the technical work in so far as it is planned to meet military requirements will be under the chief of the division of military surveys.

It is believed that this division of responsibility is definite enough to continue the present plan of efficient administration and also to provide for the specialization necessary in much of the mapping planned and indeed already in progress. The special map data desired by the War Department will thus be collected under one plan and by the same methods for certain areas, whether on the Atlantic or Pacific coast, but without affecting the general administration of the work within any division.

#### GEOLOGISTS GOOD MATERIAL FOR OFFICERS' RESERVE CORPS

Following the action of most of the topographers in the Geological Survey in joining the Officers' Reserve Corps of the Army, the geologists are contemplating a similar step. While some are of the opinion that the geologists will not be able to be of the same service to the Army as the topographers will be able to render, it is certain that they will make good material for officers in the Reserve Corps. In the first place they have received scientific college training. They have had experience in field work and are accustomed to camp life. They have a general knowledge of physiography and conditions controlling the supply of underground water and drainage. They have an intimate knowledge of extensive regions throughout the country in which they have worked. These reasons, in addition to the fact that most geologists are splendid physical specimens, will make them very valuable adjuncts to the engineer force in case of war.

### JANUARY COAL TONNAGE EXCEEDS PREVIOUS RECORDS

A greater tonnage of coal was mined during January than in any single month in the history of the industry, it is believed at the Geological Survey. January of 1916 so greatly exceeded the record of any previous month and its phenomenal production so exceeded what would have been thought possible even a year before, as to have led to the conclusion that a similar production would not take place soon. That the remarkable production of a year ago should be duplicated again this year has caused unusual comment.

The production in January would have been much greater if it had not been for railway congestion. The congestion was so great in Pennsylvania as to result in an actual decrease as compared with the figures of last year.

long been recognized, but when this high grade explosive was used in earth excavation work, the results were far from being satisfactory. This is due to the character of the material being worked, rock work requiring a quick-acting, shattering force to give results, while in earth a comparatively slower-acting and heaving or lifting effect is desired. Recognizing the necessity for an explosive of this kind, the manufacturers have worked out a low-grade, slow-acting, heaving, comparatively insensitive and safe to handle, low-freezing dynamite which contractors have been quick to adopt in their search for an efficient means of cutting down labor costs. It is used in conjunction and in combination with all types of mechanical excavators to hasten, aid, and cheapen the work. In this connection the method generally pursued is to do the drilling or punching of the bore holes, and the firing at a time when it will not interfere with the other operations.

On large projects, even where the steam shovel is used, it is generally necessary to loosen the material by blasting ahead of the shovel where large imbedded boulders, compacted earth, or hardpan are encountered. In order to secure the maximum efficiency of the machine, the shovel must be filled at every trip, hence it is not advisable to make the shovel do very much digging in hard material to fill it, as the yardage handled will be too low for any profit. Often the use of a little dynamite on large boulders, old water mains, large roots, stumps, and other obstructions will save a broken cable and consequent delays. On work such as excavations for bridge piers in dry ground, and foundations for large columns and statues which are comparatively deep and of small area, good results can frequently be obtained by loosening up the bottom with blasts and removing by means of a clam shell or orange peel bucket rig.

For smaller operations or on those which, by their nature, do not permit of the use of the more expensive large machinery, and which depend more on some sort of plowing to loosen the material, the amount of hand labor required is greater and hence more necessary for the use of labor savers. In shallow excavations where the material is not too hard to plow successfully and where ample room may be had in which to turn, the horse or tractor drawn elevator grader gives good results. The use of the wheeled scraper buck scraper, slip, and "Fresno" scrapers are limited to very soft material, hence plowing to loosen same is essential. In hard ground, or where there are boulders, roots, stumps, or hardpan, plowing becomes very unsatisfactory and costly, and sometimes, impossible. By the proper use of dynamite the plowing may be dispensed with entirely at a considerable saving, and, even in easily plowed ground where it is desired to leave the banks and corners of the excavation perpendicular, a great amount of hand picking and shoveling may be saved by blasting out the corners and sloping toes.

### DYNAMITE MAY BE MADE GREAT SAVER OF LABOR

By J. B. STONEKING, M. E.

Contractors and engineers generally are feeling the acute labor shortage, especially of the cheaper labor which is used quite extensively in excavation work, such as building foundations, basements, cellars, water storage reservoirs, trenching, and cuts in street, road and railroad construction. The number of newly arrived immigrants from which the supply for this class of labor was largely drawn has been very materially affected by the European War. This same cause is largely responsible for the demand for skilled labor like machinists and iron and steel workers, and the interest shown by manufacturers in drawing upon and training the unskilled men to fill their needs. Also, the increased wages paid to skilled workers has caused a general feeling of unrest in labor circles, which, coupled with the constantly increasing cost of living, and the insufficient supply of ordinary labor, has caused the demand and the necessity for higher wages.

In general excavation work, labor forms a very important part and one of the most variable items of cost entering into the contractors' or engineers' estimates on a "job." Hence, they are looking for and quickly seize upon any good method of saving labor, frequently developing or adapting ways and means to their needs which have been very successful in keeping down cost and enabling them to "break even" on their bids.

Probably, the chiefest of these is the development and use of the lower grades of dynamite, which is rapidly finding favor among men in this line of work. In rock, the efficiency and necessity of using dynamite has

Where the work is very small or the areas too restricted for the use of teams in plowing, the question of hand labor is a very serious one. The pick or mattox and the shovel form the principal tools. At best, this method is a very slow and costly operation, and if any other possible way can be used successfully, it is generally wise to adopt it. Low-grade dynamite is the salvation of the contractor in this case, and its successful and rational use has been the turning point from loss to profit.

If possible to put it off, excavation work should not be done while the ground is frozen, for the costs are considerably increased, however, in some cases, the work must be prosecuted vigorously regardless of weather conditions, and in working "frost" the most efficient labor-savor is the low-freezing dynamite. Care should be taken not to blast too far ahead of the shovel and scrapers or the material may consolidate again.

#### **FIND FACTORS WHICH HAD INTERFERED WITH FLOTATION**

In metallurgical research work being carried on at the Utah station, under the direction of O. C. Ralston, the results of particular value during December were the determining of the interfering factors which had caused trouble in sulphidizing and flotation of certain lead carbonate ores. Some of these ores could be concentrated successfully by this method of treatment, while others did not seem to yield. The interfering metals identified were the oxides of manganese and the insoluble basic sulphates of iron, such as Utahite, jarosite, etc. The mineralogical analysis of oxide ores is difficult, and Dr. Laney spent considerable time in determining the above facts. These metals consume the sodium sulphide used in sulphidizing, and methods of removing them or rendering them harmless will be worked out.

#### **EFFECT OF SAFETY SERVICE NOT APPARENT IMMEDIATELY**

"The average safety condition of the bituminous coal mines in Pennsylvania on Jan. 1, 1916, was 75 per cent perfect on the standard scale of measurement adopted. The average safety condition of the same mines on July 1, 1916, only six months later, was 92 per cent perfect. This condition corresponds with an improvement of from 25 per cent below standards to 8 per cent below standard, and represents a condition of safety which should correspond with a reduction of fatalities from a little over 3 per thousand to one-third this number, or something over 1 per thousand. It is rash to predict that the statistics of accidents in the mines affected by this inspection and safety service will be reflected in the statistics for this year or next. It is, however,

reasonable to believe that such a result will be effected within the next three or four years, providing as good relative progress in the improvement of the condition of the mines is made during the next few years as during the past few months." (Extract from address made by H. M. Wilson.)

#### **ADDITIONAL STUDY IS TO BE MADE OF SAGE BRUSH OIL**

Sufficient merit has been shown in the use of sage brush oil as a flotation agent to convince the Bureau of Mines that additional research may profitably be undertaken in the study of the properties of this oil. Work along this line has been conducted for some time at the Salt Lake City station of the Bureau of Mines. Dorsey Lyon, who recently has gone from the Salt Lake City station to Seattle to take charge of the new mine experiment station there, has been instructed to give sage brush oil particular attention. He is cooperating with Prof. G. H. Clevenger, the consulting metallurgist of the Bureau who is stationed at Palo Alto, Cal. That the sage brush oil problem is being considered very seriously by the Bureau of Mines is indicated by the fact that Van H. Manning, the director, and F. G. Cottrell, the chief metallurgist, have been giving the matter personal attention recently.

#### **EDMUND I. LEAVER ADDED TO TUCSON STATION STAFF**

Edmund S. Leaver has been selected as the assistant metallurgist at the Tucson mining experiment station. He attended the University of Utah from 1889 to 1894. From 1894 to 1897 he was employed as a metallurgist at Mercur, Utah. From 1897 to 1903 he was with Charles Butters & Company, Inc. During a portion of that time he was in charge of the San Sebastian mine of that company which is being developed in the republic of Salvador. Mr. Leaver was superintendent of the Dexter-Tuscarona Mining Company from 1904 to 1906. He was general superintendent of the Nevada-Goldfield Reduction Company from 1906 to 1909. In 1910 he was the manager of the Daisy Combination Mining Company and in addition did private research work. During 1914 and 1915, Mr. Leaver was superintendent of the Knight-Christensen Metallurgical Company at Silver City, Utah. At the time of his appointment he was engaged with the Tintic Milling Company. His salary will be \$2,700. He reported for duty February 1.

#### **Erect Mill in Nevada.**

The Antimony and Silver Mines Company, of Salt Lake City, are erecting a mill on their property near Battle Mountain, Nevada. The grinding equipment has been ordered from The Denver Quartz Mill & Crusher Company, Denver, Colo.

## NEW ARMOR-PLATE PLANT LIKELY TO GO TO WEST VIRGINIA, INDICATIONS POINT

Combination of Advantages in that State Expected to Outweigh those of Others—  
Coal Supply, Distance from Seaboard and Proximity to  
Iron Ore Are Points in State's Favor

That West Virginia will be the site of the Government armor-plate plant is believed by many persons who are in touch with this situation in Washington. A large number of cities in various sections of the country are working actively to secure this plant. Several southern points have been particularly active in their campaigns. The naval board, which has this matter in charge, is required to exclude from consideration all territory within 200 miles of the seaboard or the boundary line with another country. This makes it necessary for the plant to be located at some point between the Appalachian and Rocky Mountains. Since the difficulties of transporting armor plate are great, it would be prohibitive to have the plant located at a great distance in the interior and for this reason it is regarded as certain that the territory west of the Mississippi is eliminated. The same objection applies practically to most points in the Middle West.

The South seems to have been excluded by a blanket order against iron ores which are high in phosphorous. Practically all southern ores have a high phosphorous content. A few exceptions are deposits which have not been worked extensively and where the quantity of ore available has not been established.

The most effective argument which has been made in favor of West Virginia is the fact that it would be possible to build a plant where the best possible grade of coal for this purpose is immediately at hand. Since it would be cheaper to transport pig iron than it would be to transport coal for fuel, all probabilities seem to point to the selection of the site near the coal supply rather than at the point where the pig iron is made. Charleston or Huntington, W. Va. are without the 200 mile coastal zone but still would be sufficiently close to the seaboard that the finished product could be transported without great difficulty. Either site is located in a region which lends itself to defense and at the same time is not far from large supplies of the requisite grade of pig iron.

Admiral Fletcher, the head of the board, has announced an itinerary which provides for visits of the board to the principal points which have made application for the armor plate plant. After this trip, and due to the increased pressure for the commencement of the plant, it is probable that a decision in the matter will not be delayed long after the return of the board.

The Geological Survey and the Bureau of Mines have been able to furnish a great deal of valuable information with regard to iron and coal deposits of the country to the board.

### SAFETY STANDARDS RECEIVE APPROVAL IN 3 STATES

"As evidencing the attitude of the State Industrial Boards and the State Insurance Departments toward the system of insurance and schedule rating inspection by the Associated companies, it is necessary to point only to the cordial relationship established in the three coal mining States in which the law provides for compulsory workmen's compensation, coupled with a fair attitude toward an encouragement of private insurance for the obligation, viz., the States of Pennsylvania, Kentucky and Colorado. In all three States the technical value of the safety standards and the system of inspection and schedule rating the various hazards within the mine has received official approval, and has been adopted for all insurance carriers in those States. In the States of Pennsylvania and Kentucky, the Department of Inspection and Safety of the associated companies has been authorized to act as a Central Inspection and Schedule Rating Bureau for all insurance carriers of coal mine risks, with the result that in those two States over 90 per cent of the mines are insured either with the associated companies or the state fund, and are under the inspection and safety service of the associated companies, and that, in consequence, vast sums have been expended in the improving of safety conditions in the mines of those states." (Extract from address made by H. M. Wilson.)

### STUDY MATERIALS ENTERING INTO NEW INTERIOR BUILDING

Classified information as to the various structural materials entering into the construction of the new Interior Department Buildings is being compiled by the Division of Mineral Resources of the Geological Survey. It is probable that this data will form the basis of a chapter in Mineral Resources for 1916. Dr. George Otis Smith, director of the U. S. Geological Survey, chairman of the building committee, together with E. F. Burchard, in charge of the structural materials and iron work of the Bureau, are compiling some very interesting statistics with regard to the constructional materials which are going into the new home of the Geological Survey and other bureaus of the Interior Department. By taking this modern building as an example much interesting and useful information, which will apply to all building operations, will be derived, it is believed.

## MINE OPERATORS EXPRESS THEIR VIEWS WITH REGARD TO THE LABOR SITUATION

Prominent Members of the American Mining Congress Comment on This Important Feature of the Industry—Colorado Statute and Canadian Disputes Act Commended

During the past month a large number of letters have been received by the American Mining Congress with reference to the labor situation. The letters refer largely to the editorial stand taken in this matter in The Journal. The letters form a remarkable compilation of the best current thought on this important subject. Among the letters received on this subject are the following:

Bisbee, Ariz., Jan. 24, 1917.

I am not informed as to the substance of the so-called Colorado law with regard to the settlement of industrial disputes, but am familiar in a general way with the Canadian act. I note that on your recent visit to Colorado you found that the operation of this Colorado law had been eminently satisfactory to all but the officials of organized labor. As you have had the opportunity to investigate the matter personally, and as I have great confidence in your practical judgment, I may assume that the legislation referred to has been beneficial to the industry and, if so, I believe it to be the province of the MINING CONGRESS JOURNAL to advocate its extension and even its Federalization. I have read the editorial on the compulsory investigation of industrial disputes and I feel that while this is rather in the nature of radical legislation, in cases where the public is affected detrimentally by a strike or lockout, it is the only solution which can be thought of at the present time for the condition.

As president and director, therefore, I heartily approve of the proposed campaign of the Congress and believe that it would be well to print in the next number of the Journal the text of the Colorado law and handle, editorially, an indorsement thereof and a statement of its results to the present time.

(Signed) WALTER DOUGLAS.

Kenosha, Wis., Feb. 13, 1917.

With reference to the labor situation and the attitude of Congress toward the enactment of a law along the line of the Canadian Industrial Disputes Investigation Act, I will say that I am heartily in favor of such a law, because I believe that the present method used by labor—calling a strike whenever they feel like it, and in numerous cases even without having any of the differences discussed—is a menace to the prosperity of this country.

This state of affairs not only is a menace

to the prosperity of capital, but it is also a menace to the prosperity of labor, and, in fact, every person living here.

The attitude taken by your journal in the editorials on this subject meets with my hearty approval, and I hope that you will keep it up until the laws as described by you are enacted not only by Congress but by the legislature of every State in the Union.

The recent strike of coal teamsters in Chicago is a good illustration of what labor unions will do in the way of declaring strikes without even discussing their so-called grievances.

You are probably aware of the fact that this strike was called without notice, and the president of the union could not be found for an entire day, while the city of Chicago faced a fuel famine.

It will never be known how many children and invalids not only suffered, but died, on account of this inexcusable action on the part of coal teamsters.

(Signed) GEO. S. WHYTE.

Pittsburgh, Pa., January 23, 1917.

It is my judgment that inasmuch as we already have the Adamson Law, and which in all probability will be decided by the Supreme Court as constitutional, we should follow up the proposition and have the balance of the programme enacted, namely, compulsory arbitration.

If it should happen that the Supreme Court should declare this unconstitutional, then, I think, it would be well enough to drop the entire matter, although I am of the opinion that an act patterned after the Colorado Act, as you discussed in the January issue of the Journal, would be a very good thing, especially as it has to do particularly with the public.

(Signed) S. A. TAYLOR.

Duluth, January 24, 1917.

I wish to state that I am in hearty accord with the views of the Mining Congress on "Compulsory Investigation of Industrial Disputes," and you can count me as being with you in this matter, and I hope the Mining Congress will do all in its power to help bring about this condition. It is the only fair and just way to settle industrial disputes.

I have talked with a number of men of prominence here and they all feel as I do regarding this matter.

(Signed) GEO. H. CROSBY.

Charlottesville, Va., Feb. 9, 1917.

I agree with you very fully that the American Mining Congress should undertake a serious campaign to get the Congress of the United States to enact a law along the lines of the Canadian Industrial Disputes Investigation Act.

(Signed) J. S. GRASTY.

Carbon, W. Va., Feb. 13, 1917.

I heartily agree that the American Mining Congress should undertake a serious campaign to have a Federal law enacted along the lines of the Canadian Industrial Disputes Investigation Act, which makes a strike or lockout illegal until time has been given for an investigation by some appointed authority.

I also feel that both employer and employee should use their influence in their respective states to have a state law enacted similar to the Colorado law. In my humble opinion, if such could be brought about, it would truly be a blessing to both employer and employee, for it would take both out of the hands of the professional politician and professional labor leaders.

(Signed) C. A. CABELL.

Salt Lake City, Feb. 13, 1917.

I have noted with interest your editorials regarding enactment of a law patterned after the Canadian act making a strike or lockout illegal until time has been given for an investigation.

I very heartily indorse them.

I am taking the matter up with Mr. MacKenzie, the secretary of the local chapter, and he will no doubt communicate with you at length after looking into it so far as Utah is concerned.

(Signed) IMER PETT.

Janesville, Wis., Feb. 14, 1917.

I have read the two editorials on page 48 of the February Journal. The general sentiment expressed in these two editorials has my hearty approval. I was especially impressed with the fine position taken by the Governor of Colorado.

I remember to have read with strong disapproval what Mr. Gompers was reported to have said at the time the papers gave out his utterance. If that be the attitude of a substantial number of our citizens, the stability of the government is in peril. The labor organizations are constantly asking for legislation, and always to promote their own interests. They talk freely about legislation of which they approve and of which they disapprove. It is not reassuring thus to hear their great leader define what he will do if legislation be enacted that does not suit him. He must understand that government cannot be conducted on any such basis. We want labor to have wise legislation, because it is just that they have such legislation. We cannot concede to labor leaders the exclusive right to pass judgment upon what legislation is wise and to

be obeyed, and what is unwise and to be defied. There are certain elements of substantial justice which everybody recognizes, and if these elements are present, the laws that contain them must be obeyed.

As to the main point of your inquiry—the restraint upon the right to strike, pending an investigation, especially when the rights of the public are seriously involved—there ought not to be any question. In the production of coal and in the operation of railroads and other public utilities too much inconvenience and danger to the public is involved to tolerate a strike or a lockout without first having a public investigation. This is not enforcing involuntary arbitration, a method of settling disputes which I am not inclined to favor, but it secures an opportunity for the public to protect itself against high-handed procedure on the part of either party to any such controversy. If the public impose this restraint, the public will see to it that it is observed, and that justice is done speedily and fearlessly. Labor has no right to ask for anything more than justice, and if the public insist upon this right of prior investigation, neither labor leaders nor employers will be permitted arbitrarily to involve the health and public welfare of the whole community in the vicissitudes of a strike or a lockout until such investigation shall first have been made as will enable the public to form a correct judgment with respect to the merits of any controversy between employer and employee which vitally affects the public welfare.

(Signed) JOHN M. WHITEHEAD.

Columbus, Ohio, Feb. 15, 1917.

This is to state in the most emphatic manner that I favor the enactment of any law which will even have a tendency to eliminate strikes from our industrial life.

One of the great troubles of the lawmakers of the country, both State and Federal, is that they are apt to go from one extreme to the other and give little attention to the effect of the legislation which they contemplate enacting into law.

If the members of Congress would take a firm stand in defense of the principle and pay less attention to their political ambition, they would more quickly win and retain the respect of all right-thinking Americans.

In regard to law mentioned in your communication, the weakness of the proposed legislation is the fact that there is no limit placed upon the time in which an investigation should be made and a report given to the public.

I happen to know of investigations made, and by the authority of the Department of Labor at Washington. The investigation was made by representatives designated as labor mediators or conciliators, and because the findings of those investigators were adverse to the policy of the leaders of certain labor unions involved in strikes, the findings of the government investigators were not made public, but were suppressed.

You can readily understand the effect of such a report being made, either during a strike or previous to a prospective strike taking place. This is why certain labor leaders prefer there shall be no legislation which might turn the searchlight on their conduct and their policy.

I have always believed that the labor leaders or employers of labor who are afraid to permit their business to stand for public investigation, that they have no right to expect any consideration from the American people.

(Signed) T. L. LEWIS.

Washington, D. C., February 8, 1917.  
I have looked over the Mining Congress Journal and much appreciate all that you have brought forth in regard to the labor situation. Your views are most sound. This labor question is the greatest in the country and requires both sympathetic and fearless treatment. Both labor and capital should be brought closer together and their limitations and dependability upon each other discussed in a far different tone than is being at present employed.

If we do not wish finally to face a situation of internal war and which if it does take place must be more disastrous to the many than the few. The income tax return shows the small distribution of any great wealth, not over one-third of one per cent of the population. And thus, should a railroad strike be brought about, would not the poor and the children of the poor be the greatest and chief sufferers?

I am not prepared at the present time to write an article for you on the subject of the labor problem but I have it much in mind and at some future date I trust to be able to bring it forth in the form of showing the relative relationship and accomplishment of invention, mining, labor and capital.

(Signed) HENNEN JENNINGS.

Denver, Colorado, January 25, 1917.  
With regard to the American Mining Congress going on record as favoring compulsory investigation of industrial disputes, from my own view-point and from a more or less casual examination of the workings of the law, it appears to me that such a law takes out of the hands of the agitator the club that he has held over the heads of employers. It gives the men an opportunity of having the difficulties presented to them by disinterested parties and also gives employers of labor opportunities to present their cases to an impartial board, and I think that in a great majority of cases employers of labor can expect to get justice just as often as the employees themselves.

I do not see any reason why the American Mining Congress should not go on record on this subject, as I think a federal law of this

type would eventually work a great benefit to employee as well as employer.

(Signed) IRVING T. SNYDER.

Chicago, Feb. 7, 1917.

I am fully in accord with the verbiage of your editorials in the February Journal, which came to my hand today. I always believe in frankness of expression, and I feel that you make more friends by stating your views in plain language than to mean one thing and say the other.

From my viewpoint, the labor situation of this country is the greatest problem to be solved, and, as I have often said, I believe that war with a foreign nation is much more remote than are our troubles at home. If you will read the Mine Workers' Journal, or other publications gotten out by the labor unions, you will certainly find that they are not at all backward in expressing their views, and very frequently twisting facts. Therefore, it seems to me to be an absolute necessity to set forth our side in a dignified manner, placing the blame where it belongs, because even though someone may be offended for the time being, no sensible man can object to the telling of the truth.

My views on the advisability of working for the passage of an industrial investigation act along the lines of the Canadian act, after which the Colorado law was patterned, are that I strongly concur with this movement and think the Mining Congress should use every effort in that direction.

You may have read in the Chicago papers of the strike of coal teamsters, at a time when the city suffered the greatest possible coal famine, and if such a law had been enacted this strike would have been impossible. It is on this account that Mr. Gompers and his associates do not wish such legislation passed, but I think it is up to us to urge it in the strongest possible manner.

(Signed) CARL SCHOLZ.

Houghton, Mich., February 15, 1917.

My personal opinion is strongly in favor of both State and Federal laws along the line of the Canadian Industrial Disputes Investigating Act. I believe such laws will be of great benefit to labor and to the public in general.

(Signed) F. W. McNAIR.

Provo, Utah, February 13, 1917.

My views relative to the Industrial Disputes Investigation Act, which makes a strike or lockout illegal until time has been given for an investigation by some appointed authority, are that I certainly approve of such a law being passed as I consider it unfair and unjust to any corporation who has given steady employment to men to have to meet a strike condition without any notice whatsoever, as in all such cases it would cause great loss to the employer as well as the general public.

(Signed) J. WM. KNIGHT.

Joplin, February, 15, 1917.

I have read with interest, and it gives me pleasure to say that I have carefully read your editorials relative to the Industrial Disputes Act, and I am heartily in favor of the attitude taken. I have occasion also to know that some of my Colorado associates are unanimously in favor of the law and I sincerely hope that the Mining Congress will make an energetic effort towards the enactment of a Federal law and that the various States may also be brought into line in this regard.

(Signed) A. J. BURNHAM.

Chicago, Feb. 9, 1917.

I am heartily in accord with the work you have undertaken in connection with a General Industrial Disputes Investigation Act, as outlined in editorials in the last issue of the Mining Congress Journal. I should be glad to be of active service in this line if I can further the matter.

(Signed) W. T. DEAN.

Mauch Chunk, Pa., Feb. 15, 1917.

I note the strong effort you are making toward the enactment of the Industrial Investigation Act, along the lines of the Canadian act, after which the Colorado law was patterned. I think it would be a good thing for the American Mining Congress to support this measure fully and do everything in their power, and go upon record on this subject.

(Signed) M. S. KEMMERER.

Minneapolis, Minn., Feb. 10, 1917.

We are years behind Canada in properly safeguarding both labor and capital from unnecessary and destructive warfare, so frequently brought about by industrial conditions. I am not familiar with the Colorado law, but agree with you heartily that every State should have a law that would make it illegal for a strike or lockout to occur until proper investigation should be had. Of course, the labor leaders will object to this, as their business is largely trouble-making. The American Mining Congress cannot make itself of greater value than to take up this important question and see that it is solved to the advantage of all parties. The walking delegate is as much a curse to labor as he is to capital.

You have my hearty co-operation, and I hope by the next meeting of the Congress a report can be made showing that substantial gain has been made along this line.

(Signed) JOHN E. HODGE.

Philadelphia, Pa., Feb. 9, 1917.

We have reaped considerable benefits from the Colorado law being on the statute books of the State of Colorado. Consequently, I heartily indorse the movement you have

undertaken to use your best efforts in having a similar law on the statute books of every State in the Union.

If there is any manner in which the writer can assist you in this direction, he shall be very glad to render you his hearty cooperation.

(Signed) WM. WRIGHT.

Chicago, Feb. 9, 1917.

Relative to the attitude of the Journal in advocating an industrial act similar to the Canadian Industrial Disputes Investigation Act, there is no doubt the coal operators of Illinois are very much in favor of legislation of this character, and I am sure are pleased with the attitude you are taking editorially. At the Chicago hearing of the Federal Commission a couple of years ago, I explained the provisions of the Canadian act and urged favorable consideration by the commission.

(Signed) E. T. BENT.

Terre Haute, Ind., Feb. 10, 1917.

I have heard of the law in use in Canada and from what I have heard of it, I have been led to believe that it would be a good thing, but as I have never seen a copy of this law I would not like to say definitely. However, since you tell me that practically the same law is in effect in Colorado, I would like very much to have a copy of this law as soon as you could possibly get it to me, and if it is as I understand it is, I might take some steps to have it introduced in Indiana, as I am at this time a member of the Indiana State Senate, and anything that would avoid the great waste that strikes and lockout bring about, I surely would favor, if it is drawn up along the proper lines. While I have heard many favorable comments on the law referred to, I have never seen a copy of it and would like very much to have a copy of it, as I believe as a general proposition that strikes should be made so hard to bring about that it would be almost impossible to have one, at least, not until all parties have had a chance to be thoroughly investigated as to their rights in the matter, and especially so when the public, who are the innocent parties, are to be the principal sufferers.

(Signed) J. C. KOLSEM.

Columbus, Ohio, Feb. 12, 1917.

We are members of the Ohio Manufacturers' Association, which is in favor of a law of this kind.

(Signed) S. B. BELDEN.

Cleveland, Ohio, Feb. 9, 1917.

Referring to the enactment of a law along the lines of the Canadian Industrial Disputes Investigation Act, I wish to advise that my

personal opinion is that this law would be of great benefit to the industries of the United States.

(Signed) F. ARMSTRONG.

Denver, Col., Feb. 14, 1917.

We are decidedly in favor of the law you mention and hope that all of the States may pass it, as well as the Federal Government. It is a great benefit to both the employer and employee, and the only trouble in our State is that they have threatened to test its constitutionality, so that should be looked into pretty thoroughly before the bills are introduced.

(Signed) E. B. HENDRICK.

Colorado Springs, Col., Feb. 15, 1917.

Referring to the Industrial Commission Law which has been on the statute books of this State for the past two years, I will say that the law, so far as I know, is generally satisfactory to operators everywhere. An effort is being made by labor leaders to secure its repeal. We believe the law to be perfectly fair and just, and would be in favor of a federal law along the same lines. We are glad to note that you are taking an active interest in furthering this end.

(Signed) THOS F. BURNS.

Golden, Col., Feb. 14, 1917.

Concerning the Colorado law which makes a strike or lockout illegal until time has been allowed for investigation by some appointed authority, I believe nearly everyone in this country is in favor of any method which will tend to protect the rights of the general public, as well as those of the particular parties involved in labor troubles. The Colorado law certainly tends in this direction, and at the same time does not infringe too greatly on the rights of those involved in a dispute. Often a little delay in the calling of a strike or lockout will give an opportunity for the interested parties to get together, and I am, therefore, personally strongly in favor of the general principles of the Colorado law as enacted.

(Signed) R. B. MOORE.

Cleveland, Ohio, Feb. 13, 1917.

There is without any doubt no more important subject before the American people than the one of which you speak, and the American Mining Congress should do everything possible to help along this line, and we are very glad that you are taking such an active part in this matter.

(Signed) C. O. BARTLETT.

Kansas City, Mo., Feb. 10, 1917.

I feel that the work along the lines of federal legislation to improve mining conditions, getting back of laws such as are in force in Colorado, is a step in the right direc-

tion, and I am more than glad to lend any endorsement that I have in the matter.

(Signed) H. N. TAYLOR.

Canton, Ohio, Feb. 13, 1917.

My opinion is in perfect harmony with the editorial attitude of the Journal.

One of the unguarded points of our national democracy is the condition which makes it possible for a few enthusiastic and ambitious persons who through commendable energy have emerged from the proletariat, become leaders of labor organizations, and who in their enthusiasm to make a spectacular showing before their followers, promulgate disturbances in disregard to the rights of others.

The limited sphere of their activities has withheld from them that broad view of industrial progress which is necessary to conserve the interests of certain units of industrial operations that cannot be disregarded without serious damage to the whole industrial fabric.

While it is true that these people and those they represent eventually suffer more proportionately from the results of their premature acts that those they aim to best, it is not wise to depend upon this feature as a deterrent to prevent a repetition of the mistake.

While this element represents a formidable factor in our political arena, public opinion has always come to the rescue of broad-minded statesmanship.

There should, therefore, be no question about the wisdom of adopting a national safeguard such as the Colorado Industrial Commission Law, which will give time for investigation and compromise, and sidetrack many deplorable industrial revolutions.

(Signed) N. K. BOWMAN.

#### Richard B. Dole Dies

Richard Bryant Dole, a chemist who has been connected with the United States Geological Survey since 1904, died in Washington last month as a result of a nervous breakdown. Mr. Dole was graduated from Bowdoin College with honors in 1902. During the year following he was an instructor in chemistry in that school. Following this service he was State Chemist for Minnesota, from which position he went to the Geological Survey.

"T. L. Wilson and M. M. Haff have devised an improved process for ammoniating acid phosphate to prevent reversion of the compound to the insoluble form after the ammonia has been added. This end is accomplished by artificially drying the acid phosphate before adding the ammonia until the moisture in the mixture is reduced from 13 to 6 per cent. Ammonia is next introduced in the form of gas."

## MINING CONGRESS CHAPTER IN UTAH PROVING OF IMPORTANT AID TO INDUSTRY

Joins with Bureau of Mines, State Conservation Commission and State Bureau of Mines in Attempt to Push Forward the Mineral Development of the State

By A. G. MCKENZIE

Salt Lake City, February 23.—A great service has been done the mining industry in Utah by the Utah chapter of the American Mining Congress. An indication of the activity of this chapter is the recently published bulletin announcing and outlining work to be undertaken to locate, classify, develop and record the mineral resources of Utah. In this work the Utah chapter is cooperating with the United States Bureau of Mines, the Utah State Conservation Commission and the Utah School of Mines. In addition, the Utah chapter just has published the total vote by counties on the proposed amendment of the constitution of Utah relating to revenue and taxation. This amendment, which would have done an injustice to the mining industry, was defeated overwhelmingly. The Utah chapter worked energetically and successfully to this end.

From the bulletin mentioned above, the following extract is taken:

"With the intent to encourage and assist the development of the State of Utah, the Utah State Conservation Commission, the Utah State School of Mines and the Utah Chapter of the American Mining Congress, all in cooperation with the United States Bureau of Mines, have adopted an agreement and plan to collect, record, classify and disseminate data regarding the State's mineral resources.

"The plan includes free determination of the mineral nature of certain specimens, instructions in metallurgy, mineralogy, geology and mining for prospectors and such steps as may properly be taken to bring owners of mineral deposits in touch with investors for their mutual benefit and protection.

"It is not proposed to encroach in any degree upon fields now legitimately occupied by private interests. Instead, the organizations named above will endeavor to exercise functions not now being discharged and to supplement where necessary the activities of private interests to develop the State's mineral resources along the best possible lines.

"Although, as a whole, the work of each of the organizations named differs from that of the others, yet the objects of all are in many respects the same. Hence, it is thought desirable to avoid unnecessary duplication of effort by adopting a plan for cooperative work.

"A brief outline of the scope of the work of each of these organizations and other necessary information is given below so that those inter-

ested may clearly understand what is proposed to be done.

### CONSERVATION COMMISSION

"The Utah State Conservation Commission is an official body, created by an act of the legislature in 1909 to investigate and ascertain the natural resources of the State, to adopt and carry out policies and measures to prevent waste of same, to collect and publish statistics and data relating thereto and to cooperate with other agencies along the lines indicated. The Commission's activities include forestry, agriculture, water power, irrigation and minerals, in the development of all of which much valuable work has already been accomplished. The commission is composed of citizens appointed by the governor of Utah and the expense of its work is borne by the State.

### STATE SCHOOL OF MINES

"Aside from the instructions given to students attending the University of Utah and taking work in the Departments of Mining and Metallurgy, it is the aim of these departments to furnish such general information as may be possible and which may benefit the mining industry of the State as a whole. Although these departments have well-equipped laboratories for advanced or research work along the lines of ore dressing and metallurgy, the University is not authorized under the laws of the State to undertake work for private companies or individuals, especially if such work be in competition with engineers, or those conducting private laboratories for ore dressing, assaying, and chemical and metallurgical work in general. However, as before stated, it is the aim of these departments to assist in whatever manner it may be possible for them to do so, in the development of the mineral resources of the State.

### COURSE FOR PROSPECTORS

"Realizing that one way in which this can be done is to help the prospector, they are planning, in addition to cooperating with the Utah State Conservation Commission and the Utah Chapter of American Mining Congress, to offer a special short course for prospectors and those wishing to acquaint themselves with the fundamentals of metallurgy, mineralogy, geology of ore deposits and mining. This course will be given during the winter of 1916-1917. It is scheduled at this time of the year in order to

give prospectors an opportunity to enter the classes, since their work is generally at a standstill in winter. The object of the course is to give those who wish to do prospecting work a knowledge that will enable them to work to the best advantage when out in the field; to teach them how to determine the value of a mineral deposit, how to dispose of the ore, how to secure a purchaser for the property or how to interest others in its development. Many prospectors find deposits of value, but, through lack either of funds or of a knowledge of how to proceed with the exploitation of the deposit, are unable to succeed in developing the property.

"The course to be given is five weeks in length, and the subjects to be considered are to be as follows: A study of the recognition of the valuable minerals by blow-piping and other simple tests; principles underlying the formation of ore deposits, and the nature and composition of the common rocks; assaying for gold, silver, lead, zinc, copper; methods of ore treatment and the marketing of products made; methods of sampling and estimating tonnage in a deposit; mining methods with special reference to small mines and prospects.

"The course to be given is five weeks in length, and the subjects genuinely interested in such work are invited to enter the classes.

#### METALLURGICAL RESEARCH

"At its tenth regular session in 1913 the Legislature of the State of Utah provided for the establishment of a metallurgical research department in connection with the State School of Mines of the University of Utah. The act creating this department states that "The purpose of this research department shall be to conduct experiments and researches, either alone or in cooperation with the National Bureau of Mines and other agencies, with a view of finding ways and methods of profitably treating low-grade ores, of obtaining other information that shall have for its object the benefit of the mining industry, and the utilization and conservation of the mineral resources of the State, and to publish and distribute bulletins and articles to the department and its work."

"By an agreement with the United States Bureau of Mines, the work of the metallurgical research department is under the direction of metallurgists of the Bureau, assigned to duty at the University of Utah. Since January, 1914, Mr. D. A. Lyon, metallurgist, has been in charge of the work, assisted by other members of the metallurgical staff of the Bureau, assigned to duty at Salt Lake City and with headquarters at the University. Since that time, Mr. Arthur E. Wells, metallurgist; Mr. O. C. Ralston, assistant metallurgist; Mr. J. C. Morgan, chemist; Dr. F. B. Laney, microscopist, and R. E. Head, metallurgical assistant, have also been assigned to the work.

#### SCOPE OF EXPERIMENTS

"As will be noted from the above, the act creating this department states that it shall conduct experiments and researches with a view of finding ways and methods of properly

treating low-grade ores. In carrying out this provision of the act, the department first made a preliminary survey in order to obtain some ideas of the location and extent of the low-grade ore deposits of the State. After having determined, as a result of this survey, the probable tonnage of these low-grade ores samples were obtained of the same, as well as tailings and dumps. A study of these samples was made in order to determine the chemical and physical nature of the ore bodies from which they were taken. This having been done, the samples were then tested by various methods in order to find, if possible, an ore dressing or metallurgical process by which the metallic values could be feasibly and economically recovered. However, in doing this work, only those samples were selected which were fairly representative of a certain class of ore in each particular district. In no instance was work undertaken with the idea of working out a process for some particular ore and which was found only on some particular property. In other words, the department has endeavored to avoid doing work which an individual or a company should hire a metallurgist to do, as it is not within its province to do work in competition with the metallurgist or with the mining engineer. For this reason, the department cannot receive ores and make tests on them for an individual or company for the sole purpose of determining what process would be most suited to the treatment of that particular ore. When such work is desired, the department will be very glad to employ such help as may be necessary to do the work and charge it to the party wishing the work done, or to permit the party wishing the work done to do it himself, under the direction of the metallurgist in charge, it being understood that no work of this kind can be carried on in the laboratory of the department which will not, in the estimation of those in charge of the department, bear a bearing on the research work of the department that is, furnish additional information as regard the solution of similar problems. Moreover it is understood that any data or information obtained in this way shall be the property of the department as well as of the individual or company doing the work, and can be published by the department if it desires to do so.

"During the past year several companies and individuals have availed themselves of this opportunity.

"It is also stated in the act creating the department, that the department shall have for its object the collection of other information (that is, other than that obtained in making tests of ores to determine what process or processes may be best suited to their treatment) which will be of benefit to the mining industry. Therefore, in conformity with this provision of the act, and in cooperation with the Department of Mining and Metallurgy of the State School of Mines, the State Conservation Commission, and the Utah Chapter of the American Mining Congress, the department is endeavoring to collect as much information as possible regarding the mineral resources of the State.

## IDENTIFICATION OF SPECIMENS

"It hopes to render every service possible to the prospector who may wish to have minerals identified and who would like information as to the possible economic values of certain minerals. It is believed that many specimens which might lead to the discovery of important mineral deposits are discarded because the prospector is unable himself to determine their nature and does not wish to spend on an uncertainty the amount of money necessary to obtain a quantitative test. It is not within the scope of the work of this department to make tests on samples sent in which would necessitate assaying, or to make quantitative tests which would be in competition with the legitimate business of the chemists and assayers of the State. It is permissible, however, for the department to make free qualitative tests of rocks and to inform the sender of the petrographical or mineralogical name of the sample. In other words, it is within the scope of the work of the department to answer definite questions regarding samples of rocks which are sent in, if to do so does not require making an assay or a quantitative chemical analysis. In case the question asked does require the making of an assay, or of a quantitative analysis, before it can be answered, the sender of the sample will be so informed and will be furnished with a list of chemists and assayers who do such work. If the sender of the sample prefers to have the work done by the State School of Mines, the work will be done by this department and will be charged for at the same rate as is charged by local assayers or chemists, plus 10 per cent.

## UTAH CHAPTER

"The Utah Chapter of the American Mining Congress is affiliated with a national organization devoted to the development of mining and improvement of mining conditions. The membership of the Chapter consists of miners, prospectors, mine owners, mine operators, mine officials, mining engineers, assayers, chemists and others interested in the mining industry of the State of Utah. One of the specific purposes of the Chapter is to 'encourage education in practical and scientific mining and metallurgy and the acquisition of scientific information in relation to mining, metallurgy and allied industries.'

"The Chapter desires to assist in every possible way the work of mining prospectors, recognizing that all mining development has its inception in the activities of the prospector, and appreciates that authoritative identification of mineral specimens, especially those of rarer occurrence, will be of great value to the prospectors of the State.

## WORK AND EXPENSE

"The State School of Mines contributes to this work the use of its laboratories and the services of its faculty. The State Conservation Commission contributes the services of its office and field organization, including personal recon-

naissance (that is, a general examination) of mineral ground by its field secretary when necessary or desirable and bears of the laboratory expense. The Bureau of Mines contributes the services of members of its technical staff and organization. The Utah Chapter of the American Mining Congress contributes the facilities of its office and organization and shares the expense of printing, stationery, chemicals and labor to make determination of specimens submitted."

SURVEY ISSUES NEW MAP  
OF CAPITAL AND VICINITY

The Geological Survey has issued an up-to-date map of Washington and vicinity. The urgent need of an authoritative map of the area immediately surrounding the Capital City has long been recognized, as the existing maps resulting from surveys made many years ago are wholly inadequate to meet modern demands.

The field and office work in connection with the preparation of this map have not materially affected the progress of surveys in other parts of the country. The delay in the passage of two recent Sundry Civil bills postponed complete organization of field forces until well into the summer, and until the regular appropriations are available the services of the unassigned topographers were utilized on this project. Other topographers were used in this nearby field work at odd times between their regular field assignments, their field expenses in this vicinity being practically limited to electric car fares.

## Thomas M. Bannon Dies

A topographer of unusual ability, who was widely known among mining men as a result of the work he did in mineral areas, was lost to the Geological Survey last month when Thomas M. Bannon died as a result of an operation. Mr. Bannon has been connected with the Geological Survey since 1888. Among the topographical sheets on which he worked are the following: Phoenix, Ariz.; Globe, Ariz.; Riverside, Ariz.; Teton, Wyo.; Coopers Lake, Ariz.; Bradshaw Mountain, Ariz.; Saypo, Mont.; Bisbee, Ariz.; Ovando, Mont.; Sherman, Wyo.; Tucson, Ariz.; Kirwin, Wyo.; Wind River, Wyo.; Roosevelt, Ariz.; Yellowstone, Wyo.; Gros Ventre, Wyo.; Laramie, Wyo.; Monticello, N. Y.; Price, Utah; Sunnyside, Utah; Lolo, Mont.

## W. S. Robbins Dies

Willard S. Robbins, who has been a member of the staff of the Geological Survey since 1899, died in Washington last month. Mr. Robins is well known among mining men from the fact that he was in charge of the Geological Survey exhibits at the Panama-Pacific exposition, the World's Fair at St. Louis, and numerous other expositions in this country and abroad. At these expositions Mr. Robins gave a series of lectures which attracted wide attention.

## H. C. HOOVER GUEST OF HONOR AT AMERICAN MINING CONGRESS LUNCHEON

**Noted Mining Engineer Explains Work Done for the Relief of the Belgians—Mining Engineers and Geologists Resident of Washington in Attendance**

Mining engineers, geologists and others affiliated with the mining industry attended the luncheon of the American Mining Congress, February 5, at which H. C. Hoover was the guest of honor. The purpose of the luncheon was to hear Mr. Hoover's appeal for more American aid in his work for the relief of the Belgians. He explained that the work of the commission, of which he is the head, is an engineering task and for that reason one to which engineers should be particularly anxious to lend their support. A portion of Mr. Hoover's remarks on this occasion are as follows:

"Americans opened the door to Belgium and have founded and sustained this enterprise in its administrative and in its political phases. We accepted the responsibility of this foundation not for ourselves, but for America. We felt that it was the national duty for America, who stood out unharmed in this vast shelter to keep alight the lamp of humanity. Of the \$250,000,000 spent in this work, approximately \$30,000,000 has come to our hand from the public benevolence of the world and less than \$9,000,000 of this sum has come from the American people. And with the exception of one great gift of \$1,000,000 it has been the little rills of charity of the poor towards the poor. The great bulk of this expenditure has been furnished by the allied governments, and has been debited to the Belgian Government or to the communes or municipalities in northern France which have received its benefits. They have yet to repay all of this expenditure, and they assume this burden cheerfully and with the dignity of free men.

"Of this vast sum of money we have spent over \$150,000,000 in the United States in the purchase of supplies, and of this sum America has made a war profit of at least \$30,000,000. Gentlemen, Europe has begun to take stock of us. We laid claim to idealism, a devotion to humanity, and to great benevolence.

"This has a wider import than mere figures. Time and time again when the door of Belgium threatened to close, we have defended its portals by the assertion that this was an American enterprise, that the sensibilities of the American people would be wounded beyond measure, would be outraged, if its work were interfered with. Our moral strength has been based upon

this assertion. I believe that it is true; but, gentlemen, it is difficult in the face of figures I have given to carry conviction, and in the last six or eight months, time and again we have felt our influence slip from under us.

"I ask you to assume that this city and an area embracing a few counties were occupied by an enemy army. Your boundaries would be marked with a wall of steel. You would be, from military necessity, blockaded of imports. The daily flow of 70 per cent of your food supplies to your cities from beyond the wall of steel would cease, and your markets and bakeries would be empty. Every citizen and every village would hoard food to themselves. You would be interdicted from movement outside of your own ward or village, or from assembly in any manner without permission. Your railways would be taken over for military purposes. All communication would cease with the outside world. Your post, the telegraph, and the telephone would be suppressed. Your factories would be closed and half your people rendered destitute over night through their loss of wage and income. Your normal newspapers and periodical press would be suppressed. The theatres would be abandoned; your whole intellectual activity smothered. The normal seats of administration would be occupied by enemy soldiers. A sentry would stand on every street corner, and every cross-road, and the instinctive feeling of security of every free man in his right to be heard in justice would be submerged in the practical power over life and death by the enemy army. You would be called upon to contribute to the cost of the occupying army. In a word, the whole economic, intellectual and governmental functions of ordinary life would be suspended.

"In a picture of such a situation you can, however, never imagine the indescribable despair and terror of every citizen, the terror fanned by the millions of rumors which shiver through the population. Couple with this the overshadowing fear as to failure of the very food upon which your women and children survive or die. Consider to yourselves the double weight of anxiety that every understanding man in the community must feel, not only for this, the vitals of bare existence, but for the tranquility of the community lest in the riots that must mark the exhaustion of the meagre stock of food your streets should run with blood. This is war.

"To ensure efficiency we have asked for and always received the advice and gratuitous service of the world's greater commercial houses and banks and accountants and food experts.

The monument of our efficiency lies in the fact that the bread made of flour from Chicago, sold in Belgium to those who can pay has been 20 per cent cheaper than in Washington."

Those attending the luncheon in Mr. Hoover's honor were: Falcon Joslin, Philip S. Smith, R. B. Marshall, G. W. Coggerhall, Whitman Cross, Henry S. Washington, Frank Sutton, W. C. Mendenhall, Willis L. Moore, Arthur Keith, F. G. Cottrell, A. F. Lucas, Edward T. Taylor, George Otis Smith, F. L. Ransome, J. B. Umpleby, Chas. L. DuBoise, Chas. P. Neill, H. C. Morris, S. Sanford, J. Berman, W. H. Craigie, A. F. Dunnington, W. R. Warner, H. B. Patten, H. D. McCaskey, C. E. Siebenthal, Fred E. Wright, Geo. S. Rice, David White, Henry M. Auer, Chester Naramore, Donald A. McKenzie, Frank L. Hess, Albert H. Fay, E. S. Boalich, Max W. Ball, Carl H. Beal, N. C. Grover, Joel H. Watkins, A. G. Maddren, C. G. Tudor, Walter T. Paine, David T. Day, Thos. C. Havell, G. A. Waring, E. F. Burchard, D. Z. Hewett, John A. Davis, Theodore Chapin, John L. Cochrane, Frank M. Johnson, Charles L. Parsons, C. N. Fenner, Esper S. Larsen, Frank C. Calkins, B. S. Butler, Clay Tallman, J. K. Clement, Geo. S. Pope, P. M. Anderson, Philip M. Rieffkin, King H. Young, M. R. Campbell, Alfred H. Brooks, Van H. Manning, Hennen Jennings, J. F. Callbreath and Paul Wooton.

#### Complete Shaft in Norway.

The E. J. Longyear Company, Exploring Engineers of Minneapolis, has completed the sinking of a 1,100-foot shaft for the Orkla Mines Company at Lökken Verk, Norway. A part of the organization from that work will be sent to the Cuyuna Range in Minnesota, where the company is about to begin work on a shaft for the Pittsburgh Steel Ore Company at its Rowe Mine.

### Recent Legal Decisions

#### DEDUCTIONS FOR DEPRECIATION

The mining of ore is equivalent to manufacturing process in which the ore in place constitutes the raw material used. There is no more reason for allowing a lessee of a mine upon a royalty basis any deduction for depletion of ore in addition to the royalty paid than there would be to allow a manufacturer of lumber who has the right to cut and remove all the timber upon a certain section of land at so much per thousand feet a deduction in addition to the price per thousand paid, for depletion of timber for one year's cut. Each has a right to take all there is at a certain price per unit of measurement. Each is engaged in a manufacturing process, using raw material. Each is entitled to deduct

from the cost of such material used as a part of the cost of the manufacturing process. The fact that an unascertained quantity is bought does not entitle them to a deduction for depletion any more than when a specified quantity is bought. Neither does the fact that ore is taken from under the surface of the earth change the situation. The price paid by the lessee of a mine for ore taken out measures the cost of the raw material to him in the form in which he takes it, and to this must be added the cost of mining and marketing, including depreciation to plant and other proper expenses connected with the business, to arrive at the total cost thereof; and when such total cost has been allotted he has been allowed all the cost that has been incurred.

*Klar, Piquett Min. Co. vs. Platteville (Wisconsin),* 157 Northwestern, 763, p. 764; May, 1916.

#### EXPERT EVIDENCE

In an action for damages for injuries to a miner caused by a projection in an entry it is not proper for an expert or a mine examiner to testify that he had examined the mine at the place pointed out and found no conditions which he thought necessary to report as being unsafe, as it is a question for the jury, from the facts testified to, whether places and conditions are safe or dangerous, and where all the facts can be ascertained and made intelligible to the jury expert opinions as to whether such conditions were safe or unsafe should not be received in evidence.

*Bell vs. Toloca Coal Co. (Illinois),* 112 Northeastern, 331, p. 314; April, 1916.

#### MANHOLES IN ENTRY

A coal mine operator who failed to provide manholes in an entry at intervals of not more than 60 feet, as required by the statute of Kansas (Gen. Stat. 1909, Sec. 4987), cannot be held liable for injuries to a miner in the entry unless there was a causal relation between the failure to perform this statutory duty and the injury to the miner, as there can be no actionable negligence where the omission is not the proximate cause of the injury complained of.

*Oplotnik vs. Cherokee and Pittsburgh Coal Min. Co. (Kan.),* 158 Pacific, 21, p. 22; June, 1916.

#### MINERS' WASH ROOM LAW

The statute known as the "Miners' Wash Room Law" (Burns, 1914, Sec. 8623), requiring mine operators under certain stated conditions to construct and maintain a wash room for the miners is constitutional and valid.

*Princeton Coal Co. vs. Fettinger (Indiana Supreme),* 113 Northeastern, 236; June, 1916.

## FATALITY RATE IN COAL MINING INDUSTRY REACHES NEW LOW RECORD

During 1916 there Was One Death for Each 269,000 Tons of Coal Mined—Fatality Rate of Three to the Thousand Lowest since 1898, when Only Half Number of Men Were Employed

Nineteen-sixteen was a banner year in the low record of coal-mine fatalities in the United States. The decrease is about 3 per cent as compared with 1915, while the production of coal increased about 12 per cent. The number of fatalities reported during the year was 2,225 as compared with 2,269 for 1915. Figures are not yet available showing the actual number of men employed during the year, but on the basis of the number of men employed in 1915 the fatality rate was 3.03 in 1916 as compared with 3.09 per 1,000 men employed in 1915. This is the lowest rate since 1898, when about one-half the number of men were employed.

According to the Geological Survey the estimated production of coal for 1916 was 597,000,000 tons as compared with 531,619,487 tons in 1915, so that the number of tons of coal mined per fatality in 1916 was 269,000 as compared with 234,297 in 1915, and 209,261 in 1914. The production per fatality in 1916 is therefore the greatest in the history of coal mining in the United States.

During 1916 there were 11 mine disasters in each of which 5 or more men were killed, being the same number as in each 1915 and 1914. The number of men killed by these disasters in 1916 was 154, the lowest since 1901, as compared with 262 in 1915, 316 in 1914, and 464 in 1913. The principal net decreases in fatalities for the year are as follows: Falls of roof and coal, 14; gas and dust explosions, 78; explosives, 9; surface accidents of all kinds, 12. While in the above causes there was a gratifying decrease shown by reason of the educational work conducted with reference to the study of gas and dust explosions, and the introduction of permissible explosives, there was a net increase of 43 fatalities due to mine cars and locomotives underground, and an increase of 8 in various shaft accidents. As haulage systems necessarily increase in scope as the mines become larger, there should be a concentrated effort on the part of all to reduce the hazards connected with this feature of the mining industry.

Although the net decrease is not large, yet it shows that the efforts exerted by the various agencies whose object is to reduce mine accidents are meeting with success. Among the means employed to reduce accidents may be mentioned the general use of safety lamps in doubtful mines, the introduction of permissible explosives, humidifying dusty mines,

first-aid and rescue training which save lives that might otherwise be lost by reason of injuries received; the enactment of industrial accident compensation laws, and the spirit of cooperation on the part of all concerned.

### GRAPHITE MINING ON THE INCREASE; IMPORTS ARE LARGER

Much increased activity in the mining of graphite is being reported to the Geological Survey. While more mining operations of this character are being conducted in Alabama than in any other state, graphite deposits are receiving attention in several parts of the country. The graphite work at the Geological Survey is now in charge of H. G. Ferguson, who has just completed a tabulation of all purchasers of graphite in the United States. This list shows the qualities of the graphite which are being used. This list may be obtained by any one interested on application to the Geological Survey.

Despite the increasing demands on the shipping of the allied nations there has been an increase in the importation of graphite. The greater portion of this has come from Ceylon. England is allowing shipments of this graphite under certain contracts and evidently is encouraging shipments to this country where it is being used to a considerable extent in the munition industry.

### INSPECTIONS STARTED FATALITY RATES ON RAPID DECLINE

"The average number of men killed per thousand in coal mines showed a rapid decrease from the date of the earliest mine inspection in 1869, when it was nearly 6 per 1,000, to less than 3 per 1,000 in the first five years of State inspection. Little change in the fatality rate was then evident for nearly twenty years, when an increase resulted from the large production per man and the intensive activities due to the introduction of mining machinery and electricity, coupled with deeper mining. As quickly as the causes of this accident increase were determined, remedies were applied, with the result that the fatality rate in coal mining has fallen rapidly from the second maximum reached in 1907 of 4.08 per 1,000 to 3.22 per 1,000 last year, and in metal mining from 4.19 per 1,000 in 1911 to 3.54 per 1,000 in 1914." (Extract of address by H. M. Wilson.)

### TOPOGRAPHIC ENGINEERS JOIN RESERVE CORPS OF THE ARMY

Secretary Lane has approved the applications of ninety-three topographic engineers in the United States Geological Survey, Department of the Interior, for commissions in the Engineer Officers' Reserve Corps of the Army. This corps is established in conformity with the general plan, now being rapidly worked out by the War Department, to organize and have instantly available for active service in time of need a large number of specially qualified men. The topographic surveys and maps made by the Geological Survey are recognized as absolute war necessities, and this Survey is now carrying on special field work in cooperation with the Engineer Corps of the Army to produce military maps. The field engineers of the Geological Survey are all men of special training and wide experience.

The twenty-three men whose names follow have passed the necessary army examination, and it is understood that their commissions as members of the Reserve Corps will soon be issued by the War Department: Frank Sutton, Glenn S. Smith, Edwin Caleb Burt, Frank Allison Danforth, Aldace Henry Davison, John Ross Eakin, Elmer Lamont Hain, George Thompson Hawkins, William Harrison Herron, Bertram Andrews Jenkins, James Henry Jennings, Luria Lyons Lee, Leroy Streeter Leopold, James McNair Rawls, Robert Bradford Marshall, William Laval Miller, Thomas Hughes Moncure, Robert Muldrow, Charles Henry Pierce, Asahel Benson Seare, Oliver Guy Taylor, Albert Maynard Walker, John Harold Wilson.

The remaining seventy applications from topographic engineers have been forwarded by the Director of the Geological Survey to Secretary Lane who has transmitted them with his approval to the War Department. They are as follows: James W. Bagley, Newton E. Ballmer, Edward M. Bandl, Thomas M. Bannon, Ralph W. Berry, Lewis F. Biggs, Claude H. Birdseye, Sidney H. Birdseye, John E. Blackburn, Albert O. Burkland, Robert H. Chapman, Raymond G. Clinite, Charles H. Davey, George R. Davis, William E. Dickinson, Jesse A. Duck, Basil Duke, Conrad A. Ecklund, Richard T. Evans, Charles R. Fisher, Samuel P. Floore, Alvah T. Fowler, James I. Gayetty, Wilmer S. Gehres, Thomas G. Gerding, Calvin E. Giffin, Lawrence B. Glasgow, William H. Griffin, Duncan Hannegan, Charles Hartmann, Oliver W. Hartwell, Russel M. Herrington, Walter F. Hicks, Herbert H. Hodgeson, Clyde C. Holder, Frank W. Hughes, Emory I. Ireland, Oscar Jones, Sidney A. Judson, Andrew J. Kavanagh, Clyde B. Kendall, Reuben A. Kiger, James B. Leavitt, John L. Lewis, Sigurd G. Lunde, Harry L. McDonald, Eugene L. McNair, Joseph B. Metcalfe, Jr., Roy R. Monbeck, William H. S. Morey, Kostka Mudd, Oscar H. Nelson, Alexander J. Ogle, Thomas P. Pendleton, Stuart T. Penick, Albert Pike, Roscoe Reeves, Arthur C. Roberts, Leo B. Roberts, Martin A. Roudabush, Carl L. Sadler, Rufus H. Sargent, T. Foster

Slaughter, John G. Staack, Clarence A. Stoner, William O. Tufts, Dallas H. Watson, Joseph H. Wheat, Frank L. Whaley, James M. Whitman, Jr.

The total number of applications for army commissions thus far submitted amounts to 80 per cent of the topographic field force of the Geological Survey.

### CALIFORNIA INDUSTRIAL COMMISSION DOING GOOD WORK

Few efforts to secure a higher standard of conditions as effect mining are attracting more attention among Government specialists than that of the California Industrial Commission. The Bureau of Mines is cooperating with this commission. It will be recalled that H. N. Wolfkin and Edwin Higgins did notable work in this connection. Mr. Wolfkin continued in this work until he was summoned to be mine safety engineer of the Bureau of Mines. He was succeeded by Mr. Higgins, who recently resigned to enter into private employment. The demand for Mr. Wolfkin's return was so great that he again has been assigned to this work. D. J. Parker, Mr. Wolfkin's assistant at Pittsburgh, has been made mine safety engineer of the Bureau of Mines.

#### Study Regulations for Contests

Efforts are being made to secure a more systematic method of judging contests between mine rescue and first aid teams. George S. Rice, the mine engineer of the Bureau of Mines, has this matter under consideration and is discussing it with those interested.

### Personals

John A. Davis, the superintendent of the mining experiment station at Fairbanks, Alaska, was in Washington recently, before starting on a visit to the principal branches of the Bureau of Mines. Mr. Davis will familiarize himself with the work being done by the Bureau so as to be in a position to conduct the work at Fairbanks without danger of duplication. He expects to arrive in Fairbanks, June 15.

E. W. Parker, head of the Anthracite Bureau of Information at Wilkes-Barre, Pa., was a visitor to Washington last month.

Thomas N. Mordue, for the past sixteen years with Castner, Curran & Bullitt, has sold his interest in the company and is planning an extensive trip to California and Honolulu. Upon his return to Chicago, he will open offices and handle contract business.

D. W. Brunton, of Denver, formerly president of the American Mining Congress, sailed for Shanghai, China, February 12.

The Lake Superior Mining Institute will hold its annual meeting March 13-14-15, at Birmingham, Ala.

Horace V. Winchell has gone to Siberia.

Dr. Henry Mace Payne attended the Northwest Mining Convention at Spokane as a special delegate representing the American Mining Congress.

James B. Pauley, for many years connected with the International Harvester Company, has been elected vice president of the J. K. Dering Coal Company, of Chicago.

Jackson K. Dering, of Chicago, has been elected president of the O'Gara Coal Company. T. J. O'Gara resigned as president of the company to look after personal interests. This is no way interferes with the J. K. Dering Coal Company. Mr. Dering simply adds his new duties to his responsibilities.

T. M. Bannan, of the topographic branch of the Geological Survey, died in Washington last month as a result of an operation.

Frank Reed, of the Geological Survey, has been sent to Salt Lake City to study the methods of polishing opaque surfaces which have been developed at the Bureau of Mines station at that point. This method will be used in the petrographic laboratory of the Geological Survey.

Clyde T. Griswold, of the Associated Geological Engineers, is examining various fields in Oklahoma. F. G. Clapp, managing geologist of the Petroleum Division of that organization, is in Wyoming. M. L. Fuller is touring the South. Ernest Marquardt is studying southern and central fields, while E. B. Hopkins is in Mexico for clients of the firm.

President Hammerschleg of the Carnegie Institute of Technology was in Washington recently.

Dr. I. C. White, State Geologist of West Virginia, was a delegate to the annual meeting of the Chamber of Commerce of the United States which was held in Washington last month.

E. B. Sutton has been made district engineer of the Bureau of Mines for the Southeast. His headquarters are at Birmingham.



## A SULLIVAN Drill Sharpener

will increase your drilling speed and reduce your working costs, by keeping your drills supplied with clean, perfectly gauged sharp steel.

Sullivan-sharpened bits hold their edge and gauge longer than others, because they are made entirely by hammering, so that the steel is continually being toughened and given greater resistance to wear and breakage.

### As to Capacity—

One of our customers reports 438 four-point hollow steel bits made in 4 hours 10 minutes as part of the regular day's work.

Bulletin 3572

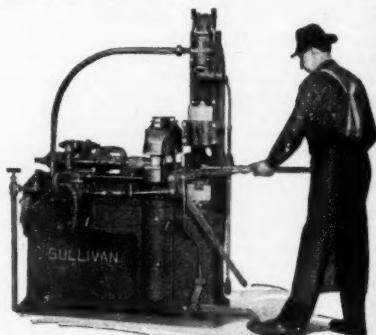
### SULLIVAN MACHINERY CO.

132 South Michigan Avenue, Chicago

New York

San Francisco

London



# THE WINTHER

affords the first and only complete line of American-made, heavy duty internal gear motor trucks—built by master builders—ready for faultless service in whatever degree.

## 4 Models

### 3,000 to 12,000 Pounds

#### Model 47— $1\frac{1}{2}$ to 2-ton

Maximum, 4,000 Pounds

#### Model 67— $2\frac{1}{2}$ to 3-ton

Maximum, 6,000 Pounds

#### Model 87— $3\frac{1}{2}$ to 4-ton

Maximum, 8,000 Pounds

#### Model 127—5 to 6-ton

Maximum, 12,000 Pounds

Produced in four models and eight capacities—capable, durable, dependable. They blanket their field.

Prominent in the specifications of the **Winther**, are its Internal Gear Drive, Locking Differentials, Drop Forged Axles, Timken Bearings, Four-Bearing Crank Shaft, Force Feed Oiling, Optional Wheelbases, Variable Frame Lengths,  $3\frac{1}{2}\%$  Nickel Gears, Constant Mesh Transmission, Vanadium Steel Springs, etc.

**The Winther Motor Truck Co.**

Kenosha, Wisconsin

# H. Channon Company

## MINING SUPPLIES

CHICAGO, ILLINOIS



Filter Cloths  
Machinery  
Contractors Equipment  
Heavy Hardware  
Manila and Wire Rope  
Machinists Supplies  
Mechanical Rubber Goods

Brattice Cloth  
Belting, Packing and Hose  
Tents  
Manufactured Canvas Goods  
Twines and Cordage  
Engineers Supplies  
Mill Supplies

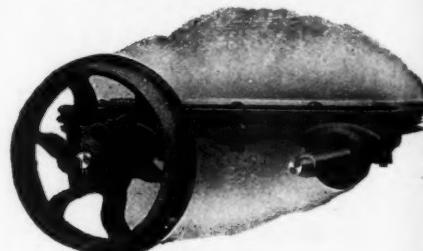


### GRIPWELL AUTO TIRES.

Unexcelled Service                              Dependable Merchandise  
New Catalogue from press soon. Send for your copy.

## Phillips Patent Open Cap Wheel Truck

THE economies that this Truck will effect are real and tangible. The wheels will not wear out internally and are guaranteed in this respect; they seldom break, due to our process of annealing and the high quality of materials used; are thoroughly chilled, and when lubricated with fluid grease will run for six months to a year with one lubrication. This Truck is used at hundreds of Mines, two concerns each using over 10,000, while literally dozens of other companies have found it profitable to discard their old running gear in order to equip their cars with it exclusively. It will pay you to investigate this Truck.



*Write for full particulars*

## Phillips Mine and Mill Supply Company

*Manufacturers of*

Mine Cars and Trucks—Gravity Screening Equipments—Larry Wagons  
Phillips Automatic Cross-Over and Automatic Push-Back Car Dumps

South Twenty-Third Street :: Office and Works :: PITTSBURGH, PENNA.



## WHITE STRIP Leather Belting

### *The Belt for Troublesome Drives*

Somewhere in your place is a drive that is troublesome—a drive on which you are constantly changing belts. There is a belt that is made especially for that difficult drive of yours—a belt that is water-proof and stretch-less.

That belt is a *White Strip*. White Strip Leather Belting has a rawhide center (a patented feature) and is of unusual tensile strength. Will outwear two ordinary belts.

Write for booklet—entitled, "Under the Seal of White Strip." Also for illustrated catalogue, which contains data and tables of value to all users of leather belting.

## Chicago Belting Company

*Makers of Superior Belts for over a quarter of a century*

102 North Green Street

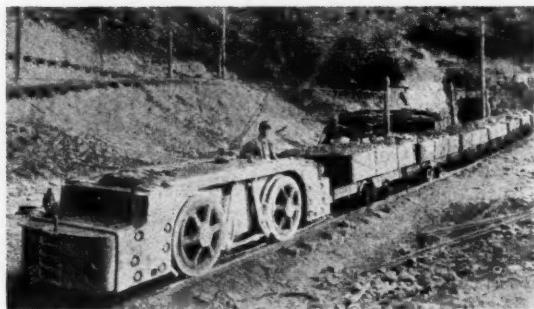
Chicago, U. S. A.

New York  
Cleveland  
Rockford, Ill.  
New Orleans

(42)

Los Angeles  
San Francisco  
Seattle, Wash.  
Portland, Ore.

# Goodman Heavy Haulage Locomotives



Frames of Cast Steel, Plate Steel and Composite Construction  
Outside and Inside Wheels—Spring Bumpers  
Anti-Friction Bearings

Every Desirable Feature of Proved Value in Advanced Modern Practice.  
Types and Designs in Variety to Meet all Haulage Conditions.

*Write for Latest Series M Bulletins.*

**GOODMAN MANUFACTURING COMPANY, Chicago, Illinois**

New York  
Charleston, W. Va.

Pittsburgh  
Birmingham

Cincinnati  
Denver

St. Louis  
Seattle  
(50)

AWARDED  
**PANAMA PACIFIC**  
**GRAND**  
**PRIZE**  
INTERNATIONAL EXPOSITION

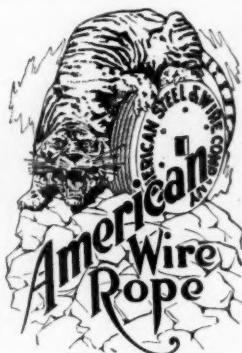
# Americore

RUBBER COVERED WIRE  
for INTERIOR WIRING  
ALL SIZES AND VOLTAGES

Every coil examined and labeled under the direction of the underwriters laboratories. Ignition wire for autos, motor boats and aeroplanes.  
Send for booklet fully describing.

American Steel & Wire Company  
Amerite  
RUBBER COVERED SIGNAL  
Wires

THE HIGHEST ATTAINABLE  
OF INSULATION STANDARDS



For elevators, dredges, lumbering, mining, oilwell drilling, suspension bridges, stump pulling, cranes, derricks, shovels, rigging and every other form of wire rope use.

Ask for illustrated catalogue.

Read about wire rope usage in its different requirements in American Wire Rope News. Gladly sent free to anyone upon request.



Made by

**American Steel & Wire Company**  
Chicago  
Pittsburgh  
New York  
Worcester  
Cleveland  
Denver



## Largest Illinois Coal Mines

are using the H. & H. Automatic Self-Dumping Cages equipped with

## Automatic Empty Car Release

**Herzler & Henninger Machine Works**  
Belleville, Illinois

## The "LITCHFIELD" High Grade Hoisting Engines

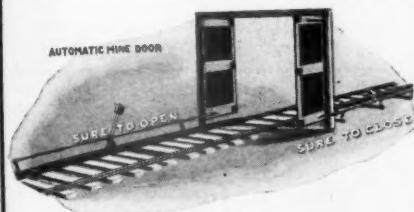
For Coal Mines  
Where Rapid Hoisting Is  
Required

ALSO  
Slope and Endless Rope  
Haulage Engines

**Heavy Duty, Chilled Tread  
or Steel Lined Tipple Sheaves  
Are Our Specialties**

**LITCHFIELD FOUNDRY AND  
MACHINE COMPANY**

**Box No. 87**      **Litchfield, Ill.**



## Practical Reasons for

# **AMERICAN MINE DOORS**

Every mining man knows that hand-operated doors are dangerous and inefficient.

Write down all their drawbacks in succession—every one you can think of. The American Mine Door isn't any one of them, but it IS safe and certain at all times.

Doesn't that make it interesting to you? Upon request, we shall be glad to tell you more about it.

**THE AMERICAN MINE DOOR CO.**  
Canton, Ohio

# Car Wheel Service

If you haven't taken advantage of our CAR WHEEL SERVICE we both lose. Just stop and consider a moment—are you open to conviction? We propose to furnish your Mine Car Wheels on a SERVICE paying basis.

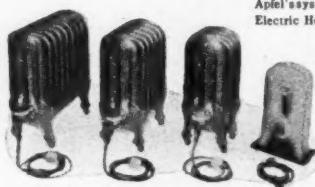
If the wheels fail—it's our loss—if they do the work you may rightfully expect—you have paid us only about what you would have paid for an ordinary wheel without a guarantee. Could we make you a more liberal offer?

Give us the diameter of the wheels you are using, capacity of car, kind of haulage and quantity usually ordered at one time and we will be pleased to quote you.

Reasonable prompt delivery  
Write us TODAY

**Southern Illinois Machine & Foundry Co.**  
Murphysboro, Illinois

# HEAT BY ELECTRICITY



Apfel's system of  
Electric Heating

Radiators of any size for any use for  
MINES POWDER THAWERS  
OFFICES MAGAZINES

**SAFE, EFFECTIVE**  
and

**100% EFFICIENT**

Write for full particulars to

**Lee Electric Radiator Co.**  
7031 Stewart Ave., CHICAGO

## Investigate This New Mining Transit

It is not too heavy to handle easily nor too light to be rigid. The NEW

### Intermediate H. & B. Transit

"For Mining Engineers"

is specially designed to meet their every requirement. Has all the distinctive advantages of the improved H. & B. Transit. Graduations upon inlaid, solid sheet silver, dust and rain guards to leveling screw, and telescope objective slide, detachable leveling heads. Backed by nearly half a century successful manufacturing experience.

Guarantee your next instrument investment by investigating this new H. & B. now. A postal request brings complete details and actual photograph. No obligation.

Write us today for catalog.

### HELLER & BRIGHTLY

Cor. Spring Garden and 12th Street

Established 1870

Philadelphia, Pa.



# Mine Ropes

OF QUALITY  
for  
HOISTING, HAULAGE or SLOPE,  
also

PATENT "KILINDO"  
NON-ROTATING

# Wire Rope

FOR SHAFT SINKING.

Sole Makers

**MONARCH PATENT  
MINE CAR HITCHINGS**

Adaptable to any System  
Haulage. Absolutely Safe

**Macomber & Whyte  
Rope Co.**

RACINE AVENUE  
KENOSHA, WISC.

# EVERLASTING LINE

Cutter Heads,  
Chains,  
Guides, etc.

For all makes of  
Breast and Shortwall Machines

Send for Booklet

**FRANK PROX CO.  
TERRE HAUTE, IND.**

**Coupon Books**  
for  
**Mine Commissaries**



The best method of handling sales. They save time and money—Stop leaks—Prevent errors—In use for a quarter century.

For Prices, Samples and Catalogues, Write

**Allison Coupon Company**  
Indianapolis Indiana, U. S. A.

**Our Automatic Skip Hoists**  
reduce the cost of handling materials to a minimum. We make the largest variety of Mechanical Dryers in the world.



**WRITE FOR CATALOGS**

Dryers . . . . .	No. 16
Screening . . . . .	No. 27
Drop Forged Chain . . . . .	No. 32
Mining Machinery . . . . .	No. 41
Crushers . . . . .	No. 42
Skip Hoists . . . . .	No. 43

Our Business is to Reduce Your Handling Costs  
THE C. O. BARTLETT & SNOW & CO.  
Cleveland, Ohio, U. S. A.  
50 Church Street, New York City

**Duck Brattice Cloth**

◆ ◆ ◆

Use only the best wearing



It costs less in the long run

◆ ◆ ◆

**Laurin H. Turner & Co.**

160 West Jackson Blvd.  
CHICAGO, ILL.

**DENVER QUARTZ MILLS**

**AND DENVER STEEL CRUSHERS**

have that kind of reliability that constantly and continuously keeps on being reliable.

**The Denver Quartz Mill & Crusher Co.**  
216-17 Colorado Bldg., Denver, Colo., U.S.A.

**Waterproof or Fireproof  
Mine — Brattice — Cloth**

Textile Ventilating, Tubing with Couplings, Shaft Sinking, Air-Curtains, Safety Lamps, Anemometers

Should you need quick orders wire us your parts needed. We are practical mining men: can act as special agents.

**A. R. LETTSOME & CO.**

1521 Lytton Bldg.

Chicago, Ill.



**PERMISSIBLE  
Explosives  
FOR USE IN GASEOUS  
AND DUSTY MINES  
ARE  
“Safety First”  
POWDERS**

**I**N loading MONOBEL or CARBONITE, the coal miner follows "safety first" procedures. He loads the cartridges with full confidence the shot will bring down the coal as wanted. With six different grades each of MONOBEL or CARBONITE available, there is a PERMISSIBLE suited to every mining condition. A century of powder making is the Du Pont Company's assurance to users of MONOBEL or CARBONITE that these explosives are of highest efficiency.

TRY A FEW SHOTS  
OF  
MONOBEL  
OR  
CARBONITE

*Write for booklet giving further information about Monobel and Carbonite.*

**E. I. du Pont de Nemours  
and Company**

Powder Makers Since 1802

## WILMINGTON, DELAWARE



**AN EXPLOSIVE FOR EVERY REQUIREMENT**

#### **ATLAS BLASTING SUPPLIES**

**Atlas Powder Company**  
WILMINGTON, DELAWARE

# The Equitable Powder Manufacturing Company

## **Alton Blasting Powder**

## **Alton High Explosives**

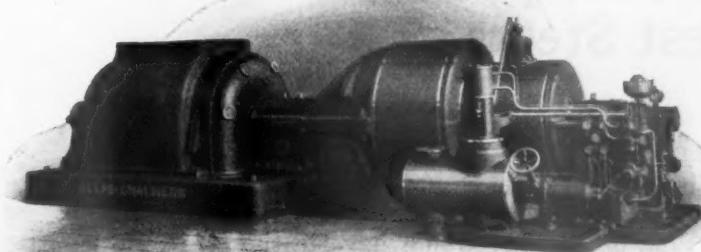
## **Black Diamond Permissibles**

**FUSE** and **CAPS**  
**Miscellaneous Supplies**

**MILLS**  
**Fort Smith, Ark., East Alton and Marion, Ill.**  
**General Offices, East Alton, Ill.**

## Allis-Chalmers Parsons Steam Turbines

Show sustained economy after years of operation  
Units in sizes from 200 kw. up



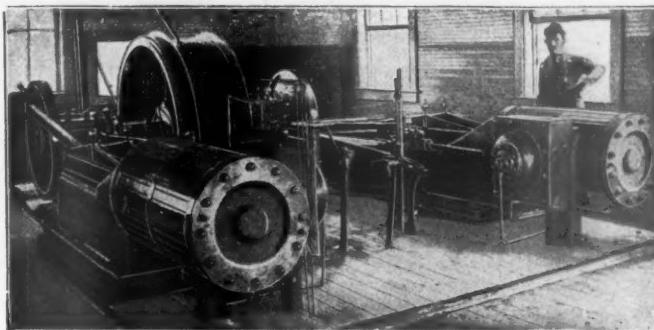
## Allis-Chalmers Manufacturing Company

MILWAUKEE WISCONSIN  
OFFICES IN PRINCIPAL CITIES

## ROBT. HOLMES & BROS., Inc.

Successors to DANVILLE FOUNDRY & MACHINE CO.

Corner North and Hazel Streets, Danville, Ill.



### MANUFACTURERS OF

Danville Hoisting and Haulage Engines, both Light and Heavy Duty Type, first and second motion.

Halbert's Patent Self Dumping Cages.

Holmes' Patent Weigh Hopper.

Plain Cages.

Holmes' Automatic Car Lifts for mine bottoms.

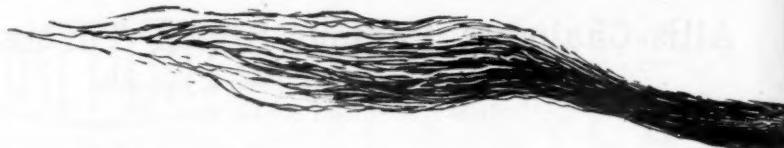
Holmes' Shaker Screen.

Iron, Bronze and Brass Castings of all description.

Holmes' Telescoping End Loader.

Heavy Iron and Steel Forgings.

All kinds of Plate Metal Work, particularly for coal mines.



## First Rope the Best Steers

Then see that the hides are removed without as much as scratching them.

Next, salt them immediately to prevent decay before placing them in vats of oak tanning liquor. Put them through the long time process and you'll have leather of which a small part can be used for making

### SCHIEREN'S DUXBAK WATERPROOF LEATHER BELTING



The part used is the best part of the center of the hides only. This is treated to a process that makes it water, oil and chemical proof and increases its pulling power considerably.

When you buy DUXBAK Belting you are sure of service—and service that is the maximum of economy

Try one of these belts on Centrifugal Pumps, Jaw Crushers, Gyrotary Breakers, Rolls, Chilean Mills, Conical Mills, Tube Mills, Stamp Mills, Trommels, Concentrating Tables, Jigs, Vanners, Blowers, Air Compressors, and Dynamos. They're certainly great.



*Chas. A. Schieren Company*  
ESTABLISHED 1868

Tanners  
Belt Manufacturers

51 Ferry Street

Chicago: 128 W. Kinzie Street  
Pittsburgh: 337 Second Avenue  
New Orleans: 404-406 Canal Street

New York City

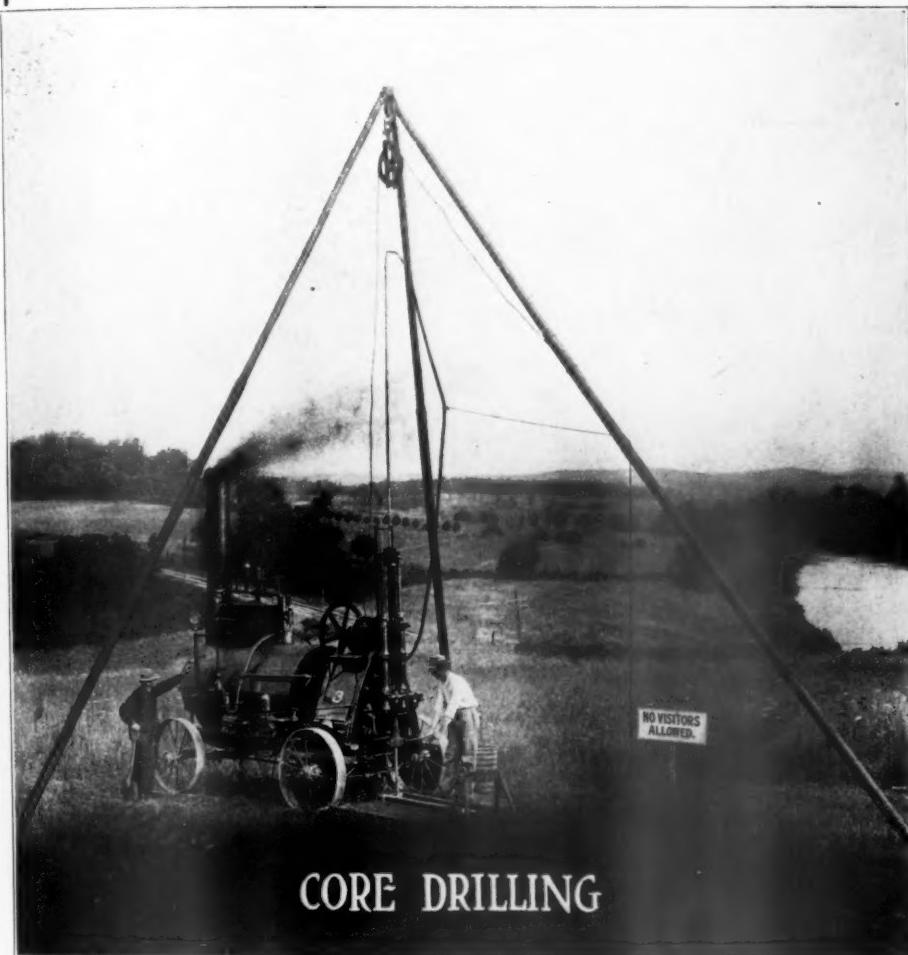
Philadelphia: 226 N. Third Street  
Seattle: 305 First Avenue South  
205 So. Market St., Dallas, Texas

Awarded the Gold Medal of Honor at the San Francisco Exposition

# H. R. Ameling Prospecting Co.

DIAMOND DRILL CONTRACTORS

ST. LOUIS, MO.

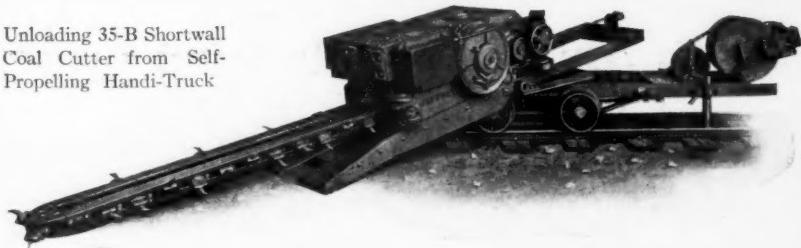


## CORE DRILLING

Fourteen years of service and not a dissatisfied customer.

Let Us do your work and You will be pleased

Unloading 35-B Shortwall  
Coal Cutter from Self-  
Propelling Handi-Truck



# OUR 1917 MODEL

## The Jeffrey 35-B

TRADE MARK

## SHORTWALL Mining Machine

Reg. U. S. PAT. OFFICE

Embodyes every known and proven device in the art of mining by shortwall machines.

The Last Word in Coal Cutter Design.

Meets practically all mining conditions.

### FEATURES:

Powerful Motor Equipment  
Simple Control Mechanism  
Narrow Cutter Bar and Narrow Base  
Independent Power Friction Feed  
Independent Power Retarding Drum  
Simple Gearing  
Self-Propelling Handi-Truck

Write us fully about your Mining Conditions, and ask for copy of Bulletin No. 192-0 on the "Care and Operation of the 35-B Shortwall Machines."

**THE JEFFREY MFG. CO., 958 North 4th St., Columbus, O.**

BRANCHES: New York Boston Charleston, W. Va. Philadelphia Scranton Pittsburgh  
Chicago St. Louis Dallas Birmingham Cleveland Milwaukee Montreal

Denver Office: First National Bank Building

Seattle Office: L. C. Smith Building

